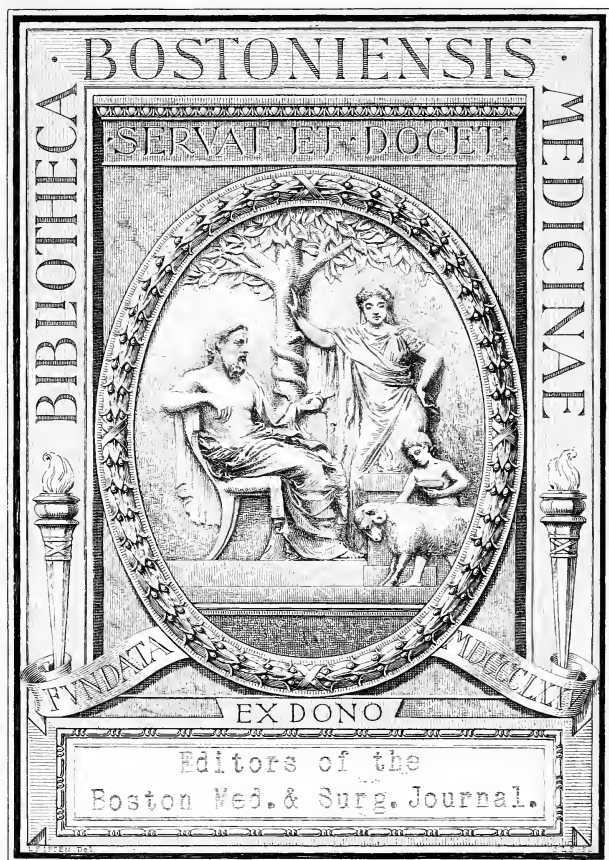


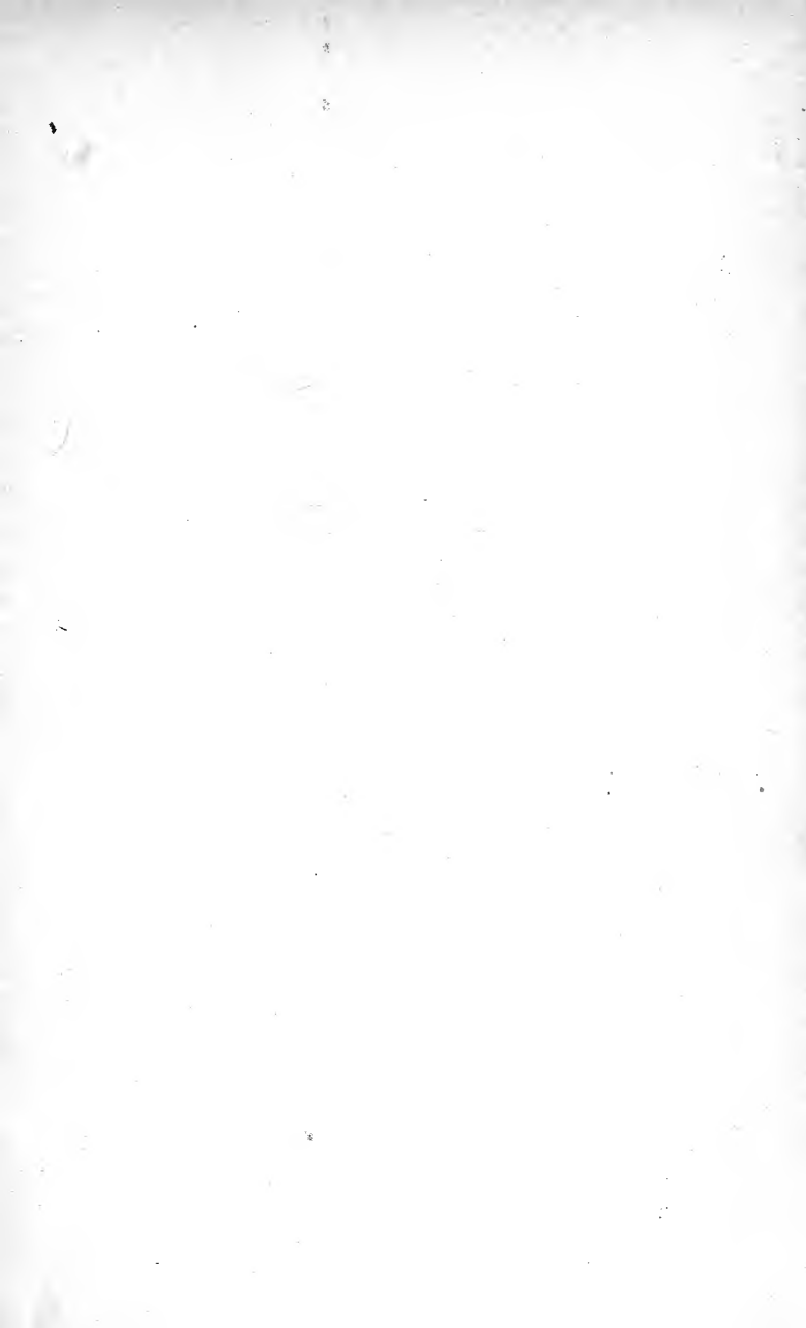
ACCIDENTS AND EMERGENCIES DULLES



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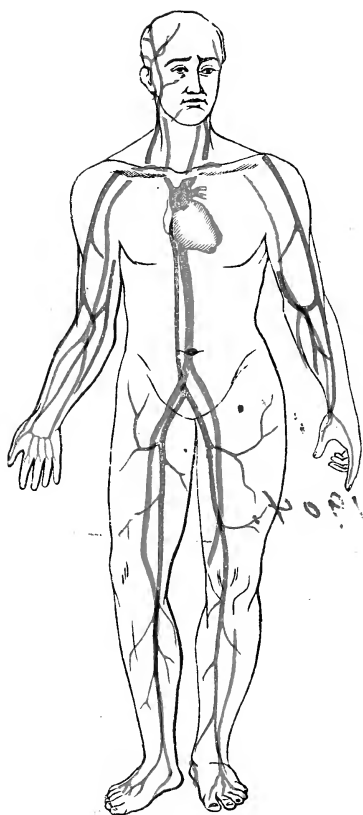
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ACCIDENTS
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EMERGENCIES

DULLES



SHOWING THE COURSE OF THE PRINCIPAL BLOOD-VESSELS

ACCIDENTS AND EMERGENCIES

A MANUAL

OF THE TREATMENT OF SURGICAL AND MEDICAL EMERGENCIES IN THE ABSENCE OF A PHYSICIAN

BY

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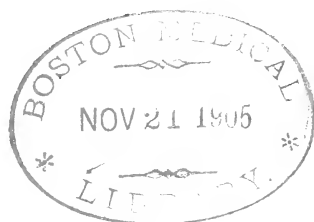
SIXTH EDITION
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With New Illustrations

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Preface to the Sixth Edition

The exhaustion of five large editions of this book, and many private communications addressed to the author, indicate that it has a distinct field of usefulness. The present edition has been carefully revised, many new illustrations, prepared especially for it, have been added, and much new matter, treating of a large number of conditions, not discussed in previous editions, but now thought to be proper to a book intended to be a trustworthy guide to those who have to give first treatment in cases of accident or to care for the sick at times or in places in which skilled medical or surgical aid cannot be had.

As in the Preface to the Second Edition, the author would again point out the way in which the book ought to be used. Let it be read over, at least once, as carefully and as studiously as possible,

so that the reader may make the acquaintance of its suggestions; and then let it be kept in some handy place, where it can be referred to immediately when an emergency arises.

*4101 Walnut Street,
September, 1904.*

Preface to First Edition

Whoever has seen how invaluable, in the presence of an accident, is the man or woman with a cool head, a steady hand, and some knowledge of what is best to be done, will not fail to appreciate the desirability of possessing these qualifications. To have them in an emergency, one must acquire them before it arises, and it is with the hope of aiding any who wish to prepare themselves for such demands upon their own resources that the following suggestions have been put together. They are not meant to be elaborate, but simple and practicable. They can not take the place of calling a physician or surgeon, but may fill up with helpful action what might otherwise be a period of inaction and despair, before skilled assistance arrives. With this view I trust they may prove of some value to the public, to whom they are offered.

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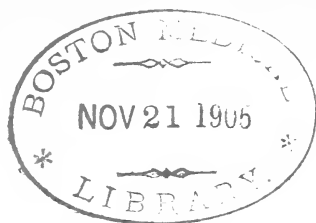
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ACCIDENTS AND EMERGENCIES.

PRELIMINARY REMARKS.

There is nothing so important in the presence of an accident or emergency as that some one with coolness and information enough should assume command and begin to set things aright. Such a one will rarely fail to be recognized by those less efficient, and will usually find little difficulty in so directing them that they shall render some valuable assistance, or at least do no harm to the sufferer. Bystanders should first be urged not to crowd, but to leave room for breathing and action. Any screaming or wailing should be stopped, if possible. Then as many persons as are needed—and no more—should be called on to assist the injured person, and if he be crushed, to remove whatever presses upon him. Next, the sufferer should be placed in a comfortable position, lying down, with the head a very little raised; after

which an investigation may be made to find out as nearly as possible what is wrong, so that an intelligent line of subsequent action may be decided upon. Everything should be done as gently as possible and without the appearance of excitement or agitation. If the person injured should vomit, his head should be so placed that the material vomited shall not enter the windpipe. It is well also to remember that there may be several injuries, and not to allow the discovery of one to lead to overlooking others.

Some one should be dispatched at once for a physician or surgeon, with a written message if possible, and certainly with one that shall give a good idea of what he may expect to find when he arrives, so that he may come provided with necessary instruments or remedies.

While awaiting him, whatever may be advisable is to be done by those at hand. Clothing may be loosened or removed * or cut away, efforts at resuscitation may be made, a stretcher or other means of transportation may be provided. Hot or cold applications, temporary splints, or means to control bleeding, may be required, and should be prepared and applied. One thing, however, ought not to be done :

* In removing clothing, that side should be first taken off which is opposite to the side of the injury ; in putting on clothes, the injured arm or leg should be clothed first.

that is, to give large quantities of whiskey or brandy, as is the almost invariable custom with people who know nothing, but want to do something. If stimulants seem to be called for, the non-medical had better use only hot water, or tea, or coffee, or milk. Alcoholic stimulants, except in small quantities, are, as a rule, not only unnecessary, but actually harmful. They often injure the patient, mislead the doctor, and interfere with the proper treatment of the case.

Exceptions to this statement may be discovered; but they are exceptions—this is the rule.

Another important point to be observed is, not to do too much. It will be making a bad use of instructions designed only for the interval between the occurrence of an accident and the coming of one whose whole time is given to the work of healing, if one who knows no more than can be gleaned from an emergency manual should act as if it had made a physician or surgeon of him. Such presumption might lead to great mortification of the amateur and to great injury of the sufferer. The true principal is, when there is pressing need, to do what is known to be helpful; and when one is not reasonably sure, to do nothing.*

* If any of the directions in the following pages seem to be incomplete, the index should be consulted to see if they are more fully explained under the head of the method or remedy suggested.

Obstructions to Respiration.

Drowning.—It may seem almost absurd to say that the first thing to be done when a person has been exposed to drowning is to remove him from the water. Yet I well remember to have seen, some years ago, the revolting spectacle of a woman's body fastened with a rope, floating in a river, and gazed at by hundreds of curious people. Upon inquiry, a policeman gravely informed me that no one dared take it out before the arrival of the Coroner. This is a mistake; any one who thinks there is a chance of resuscitation should remove from the water a person presumed to have been drowned, and at once set about to work.

Treatment.—If natural breathing has ceased, the first thing to be done is to free the body from any clothing which binds the neck, chest or waist, and to thrust a finger into the mouth and, sweeping it round, to bring away anything that may have got in or accumulated there. The body should then be turned over on the face, and one standing at the head should lean over and clasp his hands under the

pit of the stomach, and raise the body, so as to compress the belly, and drain the water as much as possible out of the lungs and stomach. An attempt must next be made to restore the breathing, if it is suspended or very weak. The most simple and practical mode of producing artificial respiration is that

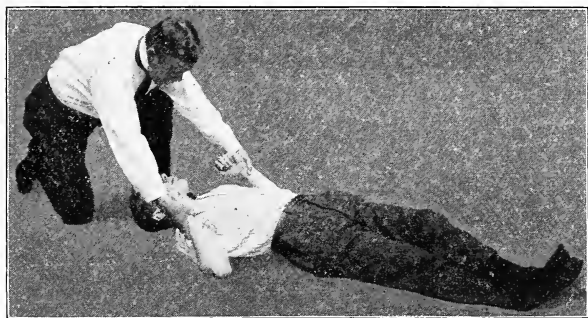


FIG. 1.—First step in artificial respiration.

known as Sylvester's method. This is conducted as follows: The body is laid flat on the back,* and the tongue is drawn well out of the mouth and held by an assistant, if there is one present. In doing this the tongue must not be dragged

* The advice to put something under the shoulders given in former editions of this book I no longer approve.

over the lower teeth so violently as to lacerate it. A very good way to get the base of the tongue clear of the windpipe is to press the angles of the jaw strongly forward with both thumbs, applied to them just in front of the lobes of the ears.

Some one now places himself, resting on one knee, behind the head, seizes both arms, which have been



FIG. 2.—Second step in artificial respiration.

bent at the elbows, near the wrists, with his thumbs pointing inward (see Fig. 1), and sweeps them round horizontally, away from the body and over the head, rising and leaning back, so as to make a good, strong pull upon them for a few seconds. (See Fig. 2.) This effects an inspiration—fills the lungs with air—by drawing the chest wall up and so enlarging the cavity of the chest. In doing this, the

rescuer may place a foot against one shoulder of the one he is aiding, to steady the body, and make his pull on the arms more effective.

The second manœuvre consists in rising, leaning over, and bringing the arms down in front of the chest, and making strong pressure with them against



FIG. 3.—Third step in artificial respiration.

the lower ribs, aided by the weight of the rescuer's body, so as to drive the air out of the chest and to effect an act of expiration. (See Fig. 3.) This need occupy but a second of time.

This procedure, regularly repeated, will make about sixteen complete acts of respiration in a minute. It should be kept up for a long time, and not

be abandoned until natural respiration is re-established, or a competent person has learned that the heart has ceased to beat. The cessation of the pulse at the wrist is not a sure sign of death. Life may be present when only a most acute and practised ear can detect the sound of the heart. In a moderately thin person, deep pressure with the finger ends just below the lower end of the breast bone may sometimes reveal pulsation in the aorta, the main artery of the body, when it can not be felt anywhere else.

In the effort to institute artificial respiration, it is desirable to have the body inclined from the hips downward to the head, if possible ; and if a table can be secured the body may be placed on it so that the head hangs over the end, thus elongating the neck ; and the legs of the table furthest from the head may be raised as shown in Figs. 4 and 5.

Tongue Traction.—A method of restoring respiration that sometimes proves successful consists in clearing out the mouth and then taking the end of the tongue in the fingers (a cloth will keep it from slipping), and drawing it fully and strongly forward about sixteen or twenty times a minute, at each time keeping it drawn out for a second or two, and then letting it go back to its natural position. This method has not proved as useful as was expected

when it was first announced, but it has done good in so many cases that it is well worth trying in case there is difficulty in carrying out the method already described as Sylvester's method.

It is important that wet clothing, if at all cold, shall be removed as soon as possible from a drowned

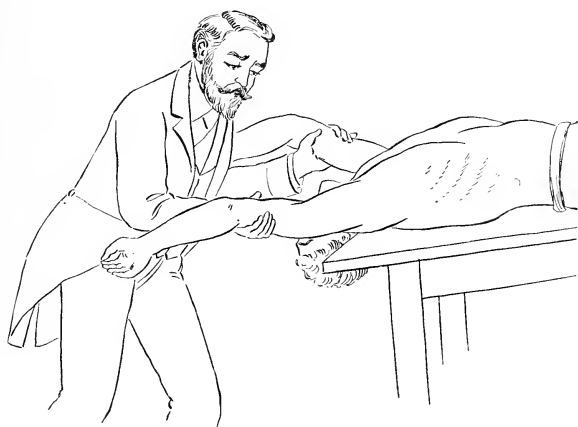


FIG. 4.—Artificial respiration on a table.

person. This can be done without interrupting the artificial respiration. If exposure of the person must be avoided, something may be laid over the body (a coat, a shawl, a blanket, a sail) and the wet clothes may be loosened under it and drawn down

over the feet. Then the body may be quickly slipped on to something dry, and covered with some other fabric, if the first has become wet, while this in its turn is pulled away from underneath.

Warmth should be secured by any means that ingenuity may suggest—hot bottles, or plates, or

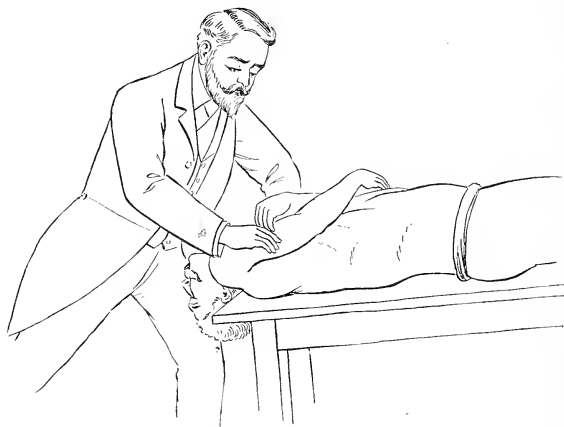


FIG. 5.—Artificial respiration on a table.

bricks, or stones, or even boards that have lain in the summer sun. At the seashore there is generally plenty of hot sand, and often plenty of baking bathing costumes drying in the sun. The body and limbs should be gently, but constantly, rubbed (the

rubbing being toward the heart), to help the blood in its labored circulation. None of these things need interfere with the efforts to secure respiration, which must be uninterrupted.

Some stimulant should be given as soon as it can be swallowed. Teaspoonful doses of whiskey or brandy, in a tablespoonful of hot water, may be given every few minutes until the danger point is passed, or about eight doses have been taken.

As natural respiration begins to be attempted, it should be aided as much as possible by timing the artificial to it. It may be stimulated by holding smelling salts or hartshorn (ammonia water) on a cloth near the nose,* by slapping the skin, or by dashing moderately hot water upon the chest. Where it is available, there is no stimulus to respiration better than that of a good Faradic battery, used so as to bring about reflex sobbing, or deep breathing, by the pain it causes.

Success in these efforts is recognized when, little by little, natural breathing takes the place of the artificial; but this must not be left unwatched or unassisted for some time.

Nothing but danger from cold, or pressing necessity, should prompt the removal from one place to

* Strong hartshorn should never be brought very close to the nostrils, as it may injure the lining membrane of the nose.

another of a person who is being resuscitated, before this has been thoroughly accomplished. If removal can not be avoided, it must be effected with great care. After resuscitation, the person should be put in a warm bed, being carried carefully, with the head low; and a watch should be kept to see that the breathing does not suddenly stop.

Where natural breathing has not ceased, all the steps just described should be carried out, with the exception of artificial respiration. But this should be had recourse to upon the first evidence that natural respiration is failing.

Strangulation, by hanging or by any constriction of the windpipe from the outside, is to be treated by re-establishing the respiration in the same way as for drowning. The obstruction is, of course, to be removed, and natural respiration must be stimulated or artificial respiration must be employed.*

Suffocation with Noxious Gases, or Vapors, or Smoke calls for instant removal to the fresh air and the establishment of natural respiration, or of artificial until the natural is re-established, as described

* A Philadelphia newspaper some years ago published a report from Pittsburg that a man had been found hanging by a clothesline in an outhouse of the Crescent Steel Works the day before. He was discovered by the watchman, who ran and called a helper; but neither would cut the man down until a physician had pronounced him dead, seeming to have a confused idea that, as this is the custom at a public hanging, it ought to be observed at a private one also.

in speaking of "Drowning" (page 13) and stimulants in moderate quantities. Coal-gas, illuminating gas, the fumes of charcoal, and the collections in mines, wells, or privies, are very dangerous to life. The removal of a person from a well full of a poisonous gas is a very difficult and delicate matter. Some attempt may be made to dislodge or dissipate the gas. Buckets of water may be dashed down, or an open umbrella may be lowered by the handle and rapidly drawn up a number of times. But these efforts must not consume any more time than is required to prepare a man who can be lowered, *securely fastened to a rope*, so that he can attach another rope to the person overcome in the well. The rescuer must be brave, cool and strong, and those who lower him no less so. He may be somewhat protected by wearing a sack over his head, or having a thick veil or a few folds of a handkerchief over his mouth and nose. But everything will depend upon the rapidity with which he and his comrades can do their work.

Choking is caused by something sticking in the throat, gullet, or windpipe. It is not always easy to tell which of these latter passages is clogged, but usually there is active irritation, with coughing, when a foreign body lodges in the windpipe, while swallowing can be done quite readily. On the other

hand, when the gullet is stopped it is usually impossible to swallow, and there is little or no tendency to cough, no matter how much the breathing may be interfered with. About the throat, it is not so hard to tell, for one can usually see or feel with the finger the offending body.

Foreign bodies in the throat, if within reach of the fingers, may be easy to remove. If not, a pair of blunt-pointed scissors may be used like forceps; or a hairpin may be straightened out and one end be bent round so as to make a loop: this to be used in trying to dislodge the foreign body; or the ring of one blade of a pair of scissors may be used in the same way; or two small spoon-handles may be used like tongs to draw the foreign body out. It has been said that a simple mode of relief for obstructions in the throat is to blow forcibly into the ear. Such a plan is so easy of execution that it is worth trying. The same is true of holding a person's head downward, and of slapping on the back.

Children not intrequently get buttons or coins or marbles in their throats, and come near choking to death. These may often be pulled out, or expelled by vomiting, if this can be provoked. Holding the body up by the legs, with the head hanging down, has sometimes aided other efforts to get rid of such

things. The responsibility of attempts to push them down may well be left to a surgeon.

If pins or needles or fish bones get stuck in the mouth or throat, it is sometimes an extremely delicate matter to remove them. Sometimes, on the other hand, they may be grasped with the fingers or a pair of blunt-pointed scissors—used like forceps—and pulled out. If this cannot be done, the patient should be made to lie down, and kept as quiet as possible in body and mind until some one comes who can give relief. A piece of candy stuck in the throat may be got rid of by sipping hot water, which dissolves the candy and relieves the spasm of the gullet.

If foreign bodies get into the windpipe they will soon be coughed out, or require surgical skill for their removal. A sharp blow on the back with the open hand, or a quick, strong squeeze of the chest, sometimes aids the coughing act; and inverting the body may assist in dislodging the foreign body.

In any case in which the breathing is not seriously interfered with, it will be most prudent for non-medical persons to keep “hands off.” For in spite of appearances there may no longer be anything in the throat, and it can do no good to make groping efforts to bring away a foreign body that has already been swallowed or expelled, only leaving behind an irritation that deceives the patient and his friends.

When things like coins, marbles, slate-pencils or nails, are completely swallowed, it is a mistake to give a purgative. The proper plan is to let the bowels alone and to give for a day or two plenty of good, solid food, especially vegetables, like potatoes, or cornmeal mush, so that the foreign body may be surrounded with the waste and carried out of the body without injuring the intestines.

Foreign Bodies in the Eye, Nose, and Ear.

Foreign Bodies in the Eye.—Small substances, like cinders, dust, or small chips of stone or metal, can usually be removed from the eye by very simple means. Sometimes there is at once a free flow of tears, that washes them out. Rubbing the other eye—a method much used by locomotive engineers—causes a flow of tears from the injured eye, and is decidedly safer than rubbing the latter. Catching the upper lid by the lashes and pulling it away from the eyeball and down over the lower lid, then letting it go, so that as it recedes its under surface is swept by the lashes of the lower lid, will often clear the eye promptly. If none of these methods proves successful, a loop made of a horse hair, or a long human hair, may be passed under the lid and swept from the outer side toward the nose and drawn down. If this does not serve the purpose, the lids must be turned inside out. With the lower lid this is easy to do ; with the upper lid it is sometimes difficult. The best way is to seize the lashes between the thumb and first finger, and

to draw the edge of the lid down and away from the eye-ball. At the same moment the tip of another finger is pressed against the skin of the lid above its edge. The patient is now told to look down, and as he does so the lashes and edge of the lid are pulled upward toward the eyebrow, while the upper part is tucked under it with the end of the second finger. Another plan is to draw the lid down; to take

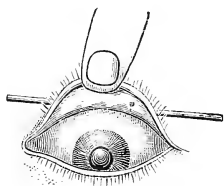


FIG. 6.

Foreign body under upper eyelid.

a very slender pencil or a knitting or crochet needle, and place it against the eyelid, parallel to and one-third of an inch above the edge, and then to pull the edge up and turn it back over this by means of the lashes. (See Fig. 6.)

In this way a large part of the eyeball and eyelid can be examined, and any foreign substance can be removed with a clean corner of a handkerchief or clean cotton. A magnifying glass and a very good light are sometimes needed in order to see fragments that have given a great deal of trouble.

One must be on his guard against the sensation that is sometimes left after a foreign body has been removed from the eye. It often feels to the sufferer

as though this were still in his eye when it is not. But a most careful search should be made before this is taken to be a self-deception; and even then it would be better to consult a more skilled person.

After removing a foreign body from the eye, the irritation may be sufficient to demand cool, wet applications, or even anodynes. Nothing is better than a thin mucilage of pure, clean gum-arabic and water, poured freely into the eye. Or, a little laudanum may be poured into a heated cup, and when evaporated to a kind of jelly it may be thinned out with clear water and then poured into the eye. A slightly warmed solution of boric (boracic) acid, (fifteen grains to the ounce), or of table-salt (a teaspoonful to a pint), is very soothing to an irritated eye. A bandage, loosely applied, so as to shut out light and keep the eyeball rather quiet, often does much good.

If removal of a foreign body proves difficult or impossible, it is usually very soothing to put a drop or two of fresh olive oil or castor oil into the eye.

When *lime* gets in the eye it may burn severely. For this the eye should be at once deluged with water, and a mixture of a teaspoonful of vinegar or lemon juice to a teacupful of water should be poured freely over the eyeball.

Foreign Bodies in the Nose.—Children sometimes place, or have placed, in their noses small

bodies, such as marbles, buttons, peas, beans, or small grains. To get rid of them, the nose should be blown hard ; or, sneezing may be excited by tickling the nose or giving snuff ; or, the child may be told to take a full breath and then be given a smart blow on the back ; or the child may be held by an assistant, while the free nostril is closed with a finger, and the operator blows sharply and quickly into the child's mouth. Some one of these plans may dislodge the foreign body. If it does not, it is best to abstain from efforts to fish it out, for such efforts may do much damage, while a foreign body in the nose is rarely dangerous or very annoying. When simple efforts to remove a foreign body from the nose are unsuccessful, a surgeon must be called ; and the sooner the better. If peas or beans, lodged in the nose, absorb moisture, they may swell, and be difficult to get away.

Foreign Bodies in the Ear.—The removal of foreign bodies from the ear is sometimes very difficult, because there is no way of getting at them from behind, and there is no natural force to be called to one's assistance. Consequently it usually requires special instruments and unusual skill. But, until these are obtained, there is no cause for anxiety ; for, except when live insects get in the ear, there is practically no danger and no pain. Here waiting is much better than working.

If no medical man can be had, and if it be remembered that the outer passage of the ear is only about an inch deep and very delicate, something may be done. If the body be a metal or mineral one, the ear may be syringed out thoroughly with warm water. In doing this, the ear should be gently pulled upward and backward, the point of the syringe being placed in the upper part of the external canal, so that the stream of water can get behind the object and sweep it out. *Exceedingly gentle* efforts may even be made to remove a foreign body with a crochet needle, or a hairpin, or an ear spoon, if it can be had. But with all these *it must be remembered that irreparable damage may be done by the least roughness or the least slip.* The syringe should not be used if the foreign body is a pea or bean; for water will make either of these swell, so as to be harder to remove.

If live insects get into the ear, oil or glycerine or salt and water (a teaspoonful to a tumblerful) should be poured in. After about half an hour the ear may be syringed in the manner already described. An ingenious method, which has sometimes been successful, is to turn the ear at once to a bright light, so as to tempt the insect to back out, on account of the attraction that light has for these creatures.

Unconsciousness or Insensibility.

Unconsciousness, or Insensibility, occurs in many different conditions, and it is of great importance that something should be known about it by railway officials and railway servants, manufacturers, superintendents of mines and public works, surveyors, constructors, keepers of hotels, and schoolmasters, and policemen. The former might often do priceless service to those who come under their care, and the last might escape much blame, and avoid some unfortunate mistakes, if they could always distinguish the effects of disease or injury from drunkenness. This, it must be acknowledged, is sometimes hard to do. But so much the more reason is there for attempting to learn enough to prevent such shameful mistakes as are sometimes made. So, before describing the treatment of conditions in which unconsciousness may be present, a little space may be devoted to considering, in a general way, how one may decide what unconsciousness is due to.

For our present purpose the cause of unconsciousness may be classified as: disorder of the circulation, disease or injury of the brain, general disease, poisoning, and intoxication.

Unconsciousness due to Disorder of the Circulation, or temporary failure of the heart, is familiarly illustrated in fainting. This may be brought about by a simple nervous influence, or by a sudden shock, or by loss of blood. In any case, the condition is easily recognized by itself or from its cause. The loss of consciousness is accompanied by paleness of the lips and face, and usually by coldness of the extremities, with more or less appearance of perspiration.

Unconsciousness due to Disease of the Brain, is usually marked by a gradual approach; and what physicians call the "history" of the case clears up this point. In apoplexies, some of the external evidences might prove misleading; but besides these there is often found an unequal enlargement of the pupils, and paralysis of the face, limbs, or body on one or both sides. In the unconsciousness of epileptic convulsions there is usually little trouble in deciding what is present, from the frothing and biting of the tongue or lips, and the peculiar cry before unconsciousness sets in, with which every one is familiar.

Unconsciousness due to Injury of the Brain causing concussion, compression, or laceration, is usually accompanied by external signs, such as swelling, bruises, or cuts, indicating that violence has been inflicted, or it occurs under circumstances that make a suspicion of violence reasonable.

Unconsciousness due to General Disease is rarely of the nature of an emergency, and is usually fully accounted for by the knowledge of the presence of some systemic disorder.

An example of this is sometimes seen in serious kidney disease. In such cases there is often a drop-sical appearance about the eyes and legs, with delirium or profound stupor, and a smell like that of stale urine about the person affected, and sometimes convulsions or twitching of the muscles.

Unconsciousness due to Poisoning with Gases or Drugs is generally easy to understand with the aid of surrounding circumstances.

The only insensibility due to drugs that is likely to be confused with intoxication is that caused by opium or chloral. But in this the pupils are strongly and rigidly contracted—the very opposite to what is seen in drunkenness.

Unconsciousness due to Intoxication (Drunkenness) is marked by many signs of other insensibilities; but it has these peculiarities: usually the

face is flushed and the body is relaxed everywhere ; the person may be roused ; both pupils are dilated ; and a distinct odor of liquor may be discovered.

Determination of the Cause of Unconsciousness.—When a doubtful case arises, the first thing to be done is to see if the odor of liquor can be detected. If not, one may be fairly sure he is not dealing with a case of intoxication. But, on the other hand, if the odor is present, one must not conclude at once that the case is one of simple drunkenness. For it often happens that liquor is given after an accident ; and an accident may have happened to a man who had been drinking. To avoid mistake :

1. *The head must be examined.* If there is a cut or a bruise, it is prudent to assume that there is a brain injury, received before or after the liquor was taken.

2. *The eyes must be examined.* If the patient tries to keep the lids from being separated, or if the eyeballs are strongly rolled up, without any squint, the unconsciousness is pretended, and the case is one of “nerves,” or hysterics. If the pupils are permanently contracted and do not dilate when the eyes are shaded, the case is probably one of brain disease or narcotic poisoning. If one pupil is contracted and the other is dilated, it is a case of injury or disease of the brain.

3. *The face must be examined.* If it is drawn and wrinkled on one side, and smooth on the other, the case is probably one of apoplexy, or obstruction of a blood vessel in the brain, or abnormal pressure upon some part of the brain.

4. *The mouth must be examined.* If it is frothy and if the tongue or the lip is bitten, the patient's condition is probably due to epilepsy, or some other convulsive disorder—not simply to intoxication. Of course, it must be borne in mind that the tongue may be bitten accidentally by being caught between the teeth in a fall.

5. *The arms and legs must be examined.* If one is stiff and one is limber, or if one moves when pinched and the other does not, the patient has one-sided paralysis, or hysterics. If the latter, the person affected will usually resist any attempt that may be made to open the eyelids; and when the eyelids are forcibly opened the eyeballs will usually be found persistently rolled up; which may be regarded as an almost infallible evidence of hysterics. At the same time close watching will generally lead to the discovery of some sign that the affected person is listening to what is being said about him or her.

6. *The temperature of the skin must be investigated.* If the skin is burning hot and dry, sun-stroke or heatstroke may be suspected, if the time

of year or the occupation of the patient warrants such a conclusion. If the skin is cold and clammy, the case may be one of heat exhaustion.

After all these tests have been applied, there will still be a few cases in which it will be hard to say (in the presence of an odor of alcoholic liquor) whether there is, or is not, some trouble more serious than mere drunkenness present. In these few cases the only safe course is to take it for granted that there is some other trouble present—even if there is intoxication too—though it be at the risk of being sometimes deceived and imposed upon. This is of especial importance in the case of persons under arrest; for many such persons have lost their lives because it was taken for granted that they were only “drunk,” while in fact they were ill or injured—with or without being drunk also. When there is any doubt, the person should be transported and treated with great care, an attempt being made to discover what disease or injury, alone or combined with intoxication, has produced the condition in which he has been found. *Such a person should never be made to walk to a police station* or be permitted to escape the vigilance of those who take charge of him, until they can rest the responsibility of his fate on others better instructed or in authority over them.

Treatment of Unconsciousness.—The treatment suitable for all cases in which there is doubt as to the cause of unconsciousness is to secure quiet and rest, the body being laid upon the back, with the head a little raised. If there is great paleness and a cold surface, with slow, sighing breathing—the signs of prostration—smelling salts or hartshorn may be held on a cloth under the nose, and hot tea or coffee may be given, while heat is applied to the body. If there is great heat of the surface, cold may be applied to the body and head, and cold drinks may be given. One precaution must always be taken in giving fluids to more or less unconscious persons, namely, to see that the fluids are swallowed, and not taken into the lungs. Even in general unconsciousness, swallowing is usually effected as soon as a fluid reaches the back of the tongue; but fluids have entered the windpipe when given by the mouth. If such an accident should occur, it would at once produce violent coughing; and this would give warning to stop the administration of the liquid.

With these general remarks on the way to decide between simple intoxication and other causes of loss of consciousness, let us now consider separately the way in which different cases should be managed.

Fits or Seizures.

Fainting is too familiar to need much detail of its symptoms: dizziness, paleness, sighing breathing, sometimes clammy sweat, loss of consciousness, and loss of muscular power. These conditions are due to a temporary weakening or pause in the heart's action, causing a diminution or suspension of the circulation of blood in the brain. The pallor of the skin is simply a signal of the like bloodlessness in the brain itself.

Treatment.—Usually no treatment is demanded in fainting; for a wise provision of nature puts the person who faints in the best position for recovery, that is, lying down. But if in any way this is prevented from happening of itself, it should be brought about by a bystander. A fainting person must be laid out flat at once. The head must be put as low as, or lower than, the body, so that the heart may not have to work against the force of gravitation in sending blood to the brain; and heavy wraps, tight collars, corsets or waistbands should be loosened or

removed. Sprinkling water upon the face and holding smelling salts or spirits of camphor to the nose, tend to excite the nerves of sensation and rouse the brain and heart to renewed activity.* Simple and gentle stimulation usually suffices to bring a person out of a faint; but if one should be very slow in reviving, it is well to apply heat to the pit of the stomach by means of a mustard plaster or hot cloths—wet or dry. But the first and indispensable thing is to lay the fainting person down flat. Nothing should be allowed to interfere with this. After a fainting fit, half a teaspoonful of aromatic spirits of ammonia with a tablespoonful of water, or a small quantity of an alcoholic stimulant (wine or whiskey) may be useful. The latter is best given with a moderate quantity of hot water.

Hysterics.—Fits of hysterics, marked by prolonged and uncontrollable laughing or crying, or by a pretense of unconsciousness, with the eyelids firmly closed or the eyeballs rolled up without squinting,† are best treated by the exercise of calmness and patience on the part of the bystanders, sometimes by taking no notice of the attack, or by leaving the

* In using strong salts or hartshorn, care must be taken not to scald the nose of the patient by holding either too close or using it too long.

† This condition sometimes follows an accident in which the patient thinks he has been worse hurt than is actually the case.

unfortunate sufferer in a room by herself or himself—for men are at times subject to this curious disorder. Heroic measures, like dashing water into the face, are not to be generally recommended. Good is sometimes done by giving teaspoonful doses of valerian or Hoffman's anodyne, if either can be obtained. A rather disagreeable but very efficient remedy is an emetic. It should be used only in cases in which the treatment is meant to be a punishment.

In Epileptic Fits the sufferer usually has a warning sensation, and often starts to leave the place he is in. There is in the attack, pallor or lividity (blueness) of the face, a peculiar cry, loss of consciousness, a moment of rigidity, and then the face becomes congested, and more or less violent convulsions come on. In these there is usually some foaming at the mouth, the eyes roll or are turned up, and often the tongue or lips are bitten.

Treatment.—Epileptic fits are to be treated very much like fainting fits, because in them also the brain is temporarily bloodless. At the same time any movements calculated to injure the person must be controlled. There is no use in struggling against such movements as will do no injury; they had better be simply regulated, and no attempt need be made to entirely prevent them; but a folded towel or a piece of soft wood or cork, with a string attached, so that

it shall not be swallowed, may be—if it can be—thrust between the teeth, to prevent the usual biting of the tongue. In doing this the helper must look out for his own fingers, lest they be bitten. When the height of the convulsion is passed, rest, quiet, and perhaps moderate stimulation may be secured. Here, again, as in fainting, the flat position of the body must be obtained; and very moderate stimulation may occasionally be useful after consciousness is restored. Usually a profound sleep follows an epileptic fit, and this should not be disturbed.

I saw, one summer, at the seashore, some ill-advised, though kind-hearted, persons walking a boy up and down the beach during an epileptic attack, because, from his pallid face, they thought he was suffering from the cold; and they were much astonished at the rapidity with which he gained entire consciousness when laid out flat on the sand.

It would be a good plan if everyone who is subject to epileptic attacks had his, or her, name and address sewed just inside the coat, or in some place where it could be seen at once when the clothing is loosened to give relief, as is almost invariably done when such attacks occur. Epileptics should not, except when it is absolutely unavoidable, go about alone, or go into crowded places. They have no right, on their own account and for the sake of

others, to incur the risks involved in such conduct, except under the stress of necessity.

Convulsions of Children and Infants are generally (in the absence of brain or kidney disease) due to some irritation of the digestive apparatus or to teething. They are usually preceded by some other evidence of irritation, such as restlessness and fretfulness. When they come on, there is a loss of consciousness, and spasms. These may affect the whole body at once, or only a half, or only one limb at a time. The eyeballs sometimes roll about, or they squint, or they are turned far up, so that only the lower part of them can be seen.

Treatment.—When convulsions occur, the child should have cold applied to the head and heat applied to the legs and body. It often does good to place it in a tub of hot water to which several tablespoonfuls of mustard has been added. A large injection of moderately hot soap-suds may also be given, to clear the bowels out; and, if possible, an emetic should be given, in the hope of removing some cause of trouble from the stomach. This may be followed by a dose of castor oil.

Apoplexy consists in the rupture of a blood-vessel in the brain, and is marked by a slow pulse, more or less sudden loss of consciousness, stupor, heavy snoring breathing, in which one cheek is sometimes

puffed out with each outgoing breath, and usually a deeply flushed face. The pupils are generally dilated. Paralysis may be observed at once, or it may appear after some time. Usually it is limited to one side; and it may be detected by observing that one side of the face is drawn up, while the other looks flabby, and the corner of the mouth on that side hangs down a little. The flabby side is paralyzed, not the drawn one, as is sometimes supposed. The face is *drawn* on the side opposite to that of the paralyzed arm or leg. The paralysis of a limb may be detected by raising it and its fellow, and noting that one drops "dead," while the other does not.*

Treatment.—For this condition, rest and cold to the head constitute the best treatment until medical advice—which is indispensable—can be obtained. If this can not be had for some time, the bowels should be emptied, if possible, with an injection of moderately hot soap-suds; and a purgative, like castor oil, or Epsom or Rochelle salts, should be given by the mouth as soon as it can be swallowed.

Intoxication (Drunkenness) sometimes closely resembles apoplexy, and should be treated in the same way until its identity can be fully established.

* There is a very rare form of apoplexy, called "pious apoplexy," in which the pupils are contracted, and there are some other signs of opium poisoning. But it may be practically excluded from the diagnosis.

For this, the odor of the breath is a useful guide ; though it should never be forgotten that the odor of liquor may be due to a stimulant given after an accident, or taken just before one. In addition, it may be remembered that in a case of deep drunkenness there is no paralysis, though there is helplessness equally on both sides, that the person can be partially aroused from the stupor, and that generally if the eyeball be touched with the finger, he will attempt to close the eyelids.

Treatment.—In a case of profound intoxication an emetic should be given, and, if any hartshorn or aromatic spirits of ammonia is at hand, a teaspoonful of this in a teacupful of water. A large draught—say, a half tumblerful—of vinegar will often go a great way toward sobering an intoxicated person. If there is much evidence of prostration, with cold, clammy skin, heat should be applied to the body to prevent collapse.

Emetics are sometimes of value in cases of profound intoxication; but it must be borne in mind that, if a mistake is made, and the trouble is an apoplexy, no more dangerous thing could be done than to give an emetic.

Catalepsy is a very rare state, somewhat resembling death, marked by more or less pallor of the skin and rigidity of the muscles, so that the limbs will

stay for some time in any position in which they are put, and *apparent* unconsciousness. In itself it is not at all dangerous, and it affords time enough to summon a physician. Meanwhile the sufferer should be kept quiet and moderately warm.

Sunstroke produces a form of unconsciousness which will be considered under the head of ‘Effects of Heat.’

Injuries to the Brain.

Concussion of the Brain, or stunning, may be caused by blows or falls on the head, or even by falls upon the feet. In such cases there is sickness, sometimes with fainting, paleness, or depression. There is usually confusion of ideas, and the sufferer cannot talk continuously or coherently. There may even be unconsciousness.

Treatment.—The proper treatment for this condition is to lay the sufferer out flat on the back, to loosen any clothing that binds his neck or waist, and to secure quiet and plenty of fresh air. If the skin becomes cold and clammy, heat should be applied to the body and limbs. No whiskey or brandy should be given.

Compression or Laceration of the Brain may be caused by the pressure of broken bone upon the brain after a fracture of the skull, or by the pressure of blood poured out by a hemorrhage inside the skull. The symptoms are loss of consciousness, sometimes paralysis, sometimes twitching of the

muscles, or even convulsions, and usually heavy, snoring breathing, with wide dilatation of one or both pupils. Often there is fever soon after the injury.

The treatment is the same as that for apoplexy.
(See p. 42.)

Effects of Heat.

Burns or Scalds are usually dangerous in proportion rather to their extent, than to their depth. Those which involve as much as half the surface of the skin are almost necessarily fatal.

The treatment of burns may be considered under two heads. The first is for the moment of the accident. When clothes are on fire the wearer must not run about, but lie down and be covered with a rug or blanket or carpet or shawl or coat—any woollen thing (not cotton or linen, for these take fire too easily) that will exclude the air and smother the flame. It is especially important to keep flames from the face, if possible. If, in fright, the sufferer loses presence of mind, some bystander must take the responsibility of throwing her (for these accidents usually happen to women, on account of the character of their clothing) down and enveloping her with some thick cover.

After an extensive Burn or Scald, so much of the clothing as has to be removed must be clipped away, cutting round portions that stick tight, or

loosening them by moistening with salt solution, so as not to burst blisters or tear off damaged skin. Blisters may be punctured at one edge so as to allow their contents to run out, and the elevated cuticle (the outer layer of the skin) to fall down upon the deeper layer. Then a dressing of pure sweet oil, or castor oil, or any oily substance free from salt, like albolene, cosmoline, vaseline, or new-washed lard, should be applied on strips of soft old linen, and disturbed as little as possible afterward. It is customary in hospitals to clip away the clothing and envelop the patient in lint soaked in "carron oil" (which is a mixture of equal parts of linseed oil and lime-water),* and to administer stimulants and anodynes. In case of a person severely and extensively burned, the entire body may be immersed in a bath, kept at a temperature of 100° . When the shock of a burn is great, moderate quantities of some stimulant should be given, and, to allay suffering, laudanum, in thirty-drop doses to an adult, and to a child as many drops as its years number. Fortunately the pain in extensive burns is relatively slight ; so that, in neces-

* To make lime-water, put a piece of unslacked lime the size of a very large walnut into a bottle containing a pint or two of cold water, shake it up a few times, then let it settle. One need not fear making it too strong ; the water will take up only a certain quantity of the lime, however much is put into it.

sarily fatal cases the absence of pain sometimes leads to false hopes of the patient's recovery.

Slight Scalds or Burns are best treated by applying a cloth soaked in a solution of baking soda (the bicarbonate) in the proportion of a heaping tablespoonful in a pint of water ; or the soda may be powdered on without using any water. This usually allays the pain more effectually than anything else that is known. Carron oil is a good application for such burns. So is the raw white of egg ; and in an emergency damp earth might be used, or soapy water, or white lead paint. A good application for burns may be made of strips of linen or muslin soaked in a mixture of a teaspoonful of carbolic acid, two tablespoonfuls of glycerine, and a pint of olive oil, or smeared with carbolized cosmoline or vaseline, obtained at a drug store. Anything may be used which will prevent friction and exclude the air ; but nothing should be used which will stick in cakes and prevent after-examination, or make this very painful. For this reason flour and cotton-batting, though often recommended, had better not be used. For most burns, simple warm or cool water with a teaspoonful of salt to the pint is better than these. Indeed, for any but the most extensive burns it is one of the best remedies. An arm or a leg may be immersed in it and left there a long while with great advantage.

Burns with Acids must be deluged with water, and then treated like other burns.*

Burns with Caustic Alkalies, such as soap-lye, should be treated with an application of vinegar, followed by applications of oil.*

Burns with Hot Pitch.—After such burns the pitch often sticks. In such a case it ought not to be removed, but should be let alone until it is coming off of itself.

Sunburn, and the burns caused by external applications, like mustard of Spanish flies (cantharides), may be treated very successfully with baking soda or a toilet powder. This may also be mixed with vaseline, or cosmoline, or lard from which the salt has been boiled out, the mixture being used as an ointment. A lotion of lime-water, with two drops of liquid carbolic acid to the fluid ounce, is a very soothing application.

Sunstroke, or more properly **Heatstroke**, is not usually due to the direct rays of the sun, but rather to a prolonged elevation of the temperature of the body, oftenest while one is working, especially in a confined place. When it takes place in the open air it is likely to occur on an oppressive, heavy, or murky day. The attack is generally preceded for

* For the treatment of cases in which acids or alkalies are taken into the mouth or swallowed, see under "Poisons."

some time by pain in the head and a sense of oppression. It culminates in a loss of consciousness, with heavy, labored breathing, and an intense, burning, dry heat of the skin, while the bladder and bowels are often involuntarily evacuated. The absence of perspiration in the presence of so great heat of the skin is one of the most characteristic symptoms of heatstroke.

Treatment.—The treatment of heatstroke consists in lowering the temperature. As much of the clothing as possible must be removed, and the patient must be transported to a cool and airy place. Cold must then be applied to the head and body, in the form of cold water or ice rubbed over the chest and placed in the armpits. Pouring, or dashing, cold water over the body is not to be advised, as it conveys a needless shock to the system; but there is nothing better than to place the sufferer in a cold bath, or to wrap him in sheets kept wet and cold by renewed applications of cold water or ice. After a while consciousness will return. Then the cold may be discontinued, to be renewed only if the surface becomes again very hot—that is, hot in contrast to that of a well person, not in contrast to the ice or water that has been used—or in case consciousness should be lost again.

Sunstroke, or heatstroke, is very dangerous, and

may be followed by grave and permanent impairment of the intellect.

Heat Exhaustion.—This is a condition of great depression of the system due to the action of heat. As it occurs in hot weather, it may be confounded with sunstroke or heatstroke. But in heat exhaustion, instead of a hot, dry skin, there is a cold, moist one.

Treatment.—Heat exhaustion must be treated with rest and fresh air, in a cool apartment; but there must be no application of cold to the surface. Small doses of whiskey or brandy, thoroughly diluted, may be given, so that the system may be gradually brought back from its depression.

Effects of Cold.

Frost-bite sometimes takes place in so insidious a way that the sufferer is not aware of it until great damage has been done. Toes are perhaps oftenest frozen or frost-bitten in this part of the world, partly because of the practice of wearing tight and insufficient coverings on the feet. Freezing of fingers, ears or noses is of less frequent occurrence.

Treatment.—All forms of frost-bite or local freezing are to be treated in the same way, which consists in gradually bringing the temperature up to the normal point (about 99° Fahrenheit) and maintaining it there. For this purpose moderate friction may be used, or soaking in moderately hot water, or the application of warm, wet cloths. Rubbing with snow is used in certain countries where snow is plenty and the custom is well established; but it is the rubbing, and not the cold, that does the good. The practice of soaking frosted feet in ice-water will soon be abandoned by any one who gives a fair trial to warm water.

Freezing.—If the whole body has been long exposed to extreme cold, there will follow a depression of vitality which requires the most cautious treatment. To restore the sufferer, restoration of his bodily warmth is indispensable. This may be effected by immersing him in a warm bath, which should be made gradually warmer until it is as hot as can be well borne. Surrounding the patient with heated blankets, or exposure before an open fire, may be used if the bath is not conveniently obtainable.* At the same time stimulants, such as hot tea or coffee, in moderate quantity, may be given internally, with the addition of small quantities of spirits.

* This recommendation is contrary to popular belief and contrary to what is taught in most text-books, as well as in books on the treatment of emergencies. But it is correct, as has been repeatedly and abundantly shown by experience in this country and by experiments made in Russia, where it was found that the best way to resuscitate dogs which had been frozen was to put them at once into a hot bath. In one set of experiments, of twenty animals treated by the "gradual" method in a cold room, fourteen died; of twenty introduced at once into a warm room, eight died; of twenty placed immediately in a hot bath, *all recovered*.

Electricity Accidents.

The passage of a powerful current of electricity through the body may cause a dangerous form of shock or even death. When such an accident occurs, the first thing to do is, of course, to release the injured person from the current, if this is still acting upon him.

To do this without danger, the rescuer must avoid making himself the line of passage for the current. So he must not touch with any part of his body a live wire or a lamp or generator or transformer, while another part of his body is in electrical contact with the ground, either directly or by means of a moist or a metal surface. He should never take the risk of touching a live wire with both hands at once; and it is well not to permit any two parts of the body to come at the same time into contact with a live wire or any electrical apparatus. He must not touch the body of a victim of electricity still in the circuit, unless his own body is thoroughly insulated, or he may die too. If possible, a rescuer should be

insulated by having a good non-conductor under his feet and another to protect his hands. Fair insulation is secured by wearing rubber shoes or boots and rubber gloves ; and a person well insulated may handle a live wire with comparative impunity, if it does not come into contact with any unprotected part of his body.

Besides rubber there are several insulating materials that will serve quite well in an emergency. Of these may be mentioned, for the feet, a dry board, and for feet or hands, a number of folds of dry cotton or woolen cloth or of paper. Silk also is a good insulator. In case of accident a quick-witted helper may stand upon a board, or a book, or a coat, if he has no rubber shoes, and may then move a wire with a hand protected with a thick, dry, cotton or woolen glove or with some other dry stuff. In cutting a wire, the feet should be insulated if possible ; but if they are not, there will be little danger if the hands are protected as just described, or if an axe or a hatchet with a dry wooden handle is used. Live wires held by the sufferer may be "short-circuited," by dropping (not laying) across them a metal bar, like a poker or a crowbar.

Electricity accidents do not admit of wasting time in hunting up what is needed ; and the best helper will be the one who finds in his pocket, or on his

back, some good insulating materials, and who puts them in use immediately.

After a live wire is cut, it will be well, if there is time, to wrap its end with a piece of cloth, or to put it into a rubber boot, so that it shall not keep up an alarming running fire on the ground, or on a metal roof, or do injury to a new victim.

When a person who has received a severe shock has been released from the current, he should be laid down in a safe place, his clothing should be loosened, and he should have plenty of fresh air and bodily rest. Medicines are not of much use, but the body must be kept comfortably warm, and if the breathing is suspended or feeble, artificial respiration may be set up in the manner described in speaking of "Drowning." (See p. 13.) The mouth will not have to be cleared as in drowning accidents; but care must be taken that the tongue does not fall back, so that its base shall close the breathing passages.

If these suggestions are followed, any one who has not received a shock instantly fatal may be expected to recover. Complete recovery may take some time; but the beginning of recovery will not be long delayed.

Lightning Stroke.—The effect of a stroke of lightning is like that of a violent shock of any kind

of electricity. There may be instant death, or unconsciousness with great depression of the circulation or respiration. The treatment for this condition is the same as that just described, namely, rest, fresh air, warmth to the body, possibly moderate stimulation, and artificial respiration if necessary.

Burns caused by electricity (artificial or lightning) must be treated as described under the head of "Burns."

Sprains.

Sprains are sometimes quite trifling injuries, and require no treatment but a little rubbing or a little rest. At other times they are more serious and require as careful treatment as fractures do. In all forms of sprain, rest is the most important thing to be secured until a surgeon comes, and next in value is moist applications.

To secure rest, a bandage will sometimes suffice; but a splint may be required. The sprained part may be supported by having a neatly folded towel (as they come from the ironing-table) folded again, so as to make a sort of trough splint, and placed around it before the bandage is put on. Such a towel splint may be soaked with cool water before or after it is applied.

Besides this mode of treating sprains, wooden or other splints may be used if necessary and convenient.

In Sprains of the Wrist the hand and forearm may be laid on a straight splint, padded with cotton

or wool or old linen so as to make the surface soft, and be lightly secured to it with a soft bandage or broad strips of sticking-plaster. One of these strips should go round the hand, and one or two round the forearm above the wrist—not over it. A bandage should cover all.

Sprains of the Ankle should never be treated lightly. In them there is not infrequently a fracture of the inner surface of one of the leg bones at the ankle joint. This complication gives rise to so much trouble, and requires such skilful and patient treatment, that it has come to be believed that it is better to have a broken leg than a sprained ankle. The general requirements in the case of a sprained ankle are: To put the joint at complete rest and reduce the swelling; to allay inflammation, if it arises; and afterward to promote the absorption of inflammatory products. For the first, a splint and bandage usually suffice; for the next, applications of hot or cool water; for the last, friction, and kneading of the joint, with careful motion of it, and alternating hot and cold douching. But in few cases it is truer that “he who doctors himself has a fool for a patient.”

Dislocations.

A dislocation consists in the displacement of the articular (or joint) end of a bone. It can not occur, except when the same joint has been out of place before, without the tearing of ligaments whose function it is to keep the joint close. A dislocation can be detected by the occurrence of pain and comparative immobility of the joint. There is also deformity, which can generally be made apparent by comparing the contour of the injured joint with that of the corresponding sound one of the other side.

Dislocation of the Fingers may usually be reduced—or put in place—by strong pulling, aided by a little pressure upon the parts of the bones forming the joint. These must then be retained in place with a splint and bandage, or sticking plaster.

Dislocation of the Thumb is, even for surgeons, sometimes almost impossible to put in place. It cannot usually be reduced by pulling; but require that the thumb shall be bent further back toward the wrist, while firm pressure is made against the

base of the dislocated bone—at the point of dislocation—pushing it away from the wrist, and downward towards the palm.

Dislocation of the Lower Jaw may be treated by almost any one. This is fortunate, since it is a very awkward dislocation and very trying to the patient.

To reduce a dislocation of this sort, the sides of the jaw must be seized between the thumb and fingers of each hand, with the thumbs resting on the teeth and the fingers below the jaw, and firm pressure must be made, first downward and then backward. It is important to cover the thumbs with several thicknesses of cloth, and as soon as the jaw starts into place to slip them off to the outer side of the teeth, inside the cheeks, or the releaser is likely to be rewarded by having his thumbs mashed between the patient's jaws. He must be very quick, too, for the muscles do not wait, when they have been so unnaturally on the stretch, but bring the lower teeth instantly against the upper like a hammer.

There is a form of dislocation of the jaw in which this is just a little open and can not be opened wider or closed. Such a condition may be treated by slipping a strong spoon-handle or table-knife between the teeth and prying the jaw wider open. This will make the bone slip back into its place.

Dislocation of the Shoulder, that is, of the upper arm bone from its socket, may be reduced by laying the patient down, sitting alongside of and facing him, and placing the nearest heel (with the boot or shoe removed) in the armpit of the injured side, and then drawing down the dislocated arm and dragging it over toward the sound side. This will usually pry the head of the bone outward and upward into its place. If this does not succeed readily, the amateur surgeon had better let the dislocation alone. If it does succeed, the bone will go in with a snap. The arm should then be bound to the side, with the forearm carried across the chest and the hand placed on the opposite shoulder.

Dislocation of other Joints ought not to be tampered with at all. The best that can be done for them is to put the parts in the position easiest to the sufferer, to surround the joint with cool, wet cloths, on which laudanum has been poured, and to send for a surgeon. The risk of doing injury by injudicious efforts to set a joint is greater than that of waiting until a surgeon can be summoned.

Fractures—Broken Bones.

Broken bones may be recognized by the occurrence of pain, of deformity, of bending where they ought not to bend, and of a sound and feeling of grating on motion at the point of fracture. There are two important divisions of fractures—simple and compound. In simple fractures the break does not communicate by a wound with the air; in compound fractures the bone cuts through the skin, or there is an opening from the exterior to the seat of fracture. The latter are far more serious and dangerous than the former.

Broken bones require treatment as various as the fractures themselves are. Most of them require special appliances, known only to surgeons, and no attempt should be made by any one who has not surgical training to do more than treat a fracture temporarily. However, until the presence of a surgeon can be secured, the following suggestions may be adopted, as far as the circumstances will permit.

Fracture of the Upper Arm should be treated by applying a padded splint to the outside of the

arm, from the top of the shoulder to the lowest point of the elbow, and a shorter one inside from the armpit to the elbow. If no splints can be had,



FIG. 7.—Dressing for fracture of bone of the upper arm (humerus).

the elbow should be drawn down and placed against the side of the chest, with a layer of muslin or linen

between the chest and arm to keep the two skin surfaces from coming in contact, as this (especially in summer, when perspiration is free) might cause

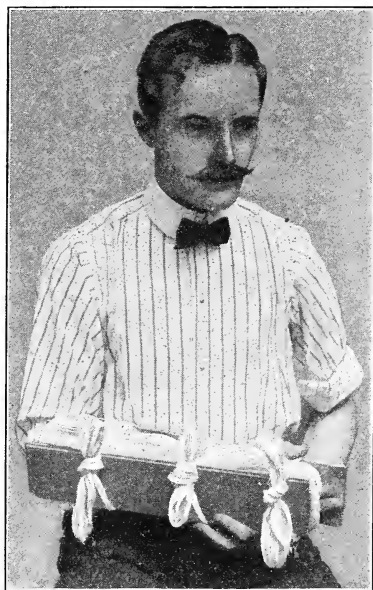


FIG. 8.—Dressing for fracture of bones of the forearm (radius and ulna).

irritation and even an inflammation of the skin. Then the whole upper arm may be bound gently

but securely to the body, and the forearm should be carried in a sling, so arranged that the hand shall be raised a little higher than the elbow. This point is very important, for if the hand is lower than the elbow it is likely to swell and become painful. (See Fig. 7.)

Fracture of the Forearm.—In this the arm should be bent to a right angle at the elbow, and placed in a position as nearly natural as possible, with the thumb pointing up. Then a broad, well padded splint should be placed along the back of the forearm and hand, going all the way to the tips of the fingers, and another along the front, padded so as to fit to the proper shape of the parts, and not long enough to press against the upper arm when the sling is applied. (See Fig. 8.) The splints should be bound on snugly but not too firmly, and the whole carried in a sling with the hand higher than the elbow. In extemporizing a sling for the arm, the sleeve of a coat or shirt may often be utilized by pinning it across the chest; or part of the frock of a coat may be turned up and pinned to the body of it. In using a handkerchief or other cloth, this should be folded into a triangle and the long, straight edge placed next to the hand. The angle should be carried back toward the elbow and may be pinned fast there. This will support the whole of the forearm equally.

Fracture of the Bones of the Hand below the wrist may require only rest, because each is pretty well supported by its fellows ; but a splint along the back of the arm and extending to the tips of the fingers may be needed to secure proper rest and inaction.

Fracture of the Finger.—A broken finger should be straightened out, and bound to a very light splint reaching from the wrist to the tip of the finger. The splint is usually more comfortable if applied to the back of the hand and finger. It should be, of course, padded.

Fracture of the Thigh-bone.—In this fracture, after drawing the knee strongly downward, to overcome the shortening, the thigh may be bent up toward the abdomen and the lower leg back toward the thigh, so as to relax all the muscles. Then one splint can be applied to the front of the thigh and another to the back, and bound to it ; after which the knee should be supported by a firm pillow. As a temporary arrangement, the sufferer may have both legs tied together and lie on his sound side on a firm bed, with the broken limb uppermost, the heels drawn up near to the buttocks, and each knee opposite the other knee. A pad must always be placed between the knees, or the pressure of one on the other may cause much discomfort. A more complete

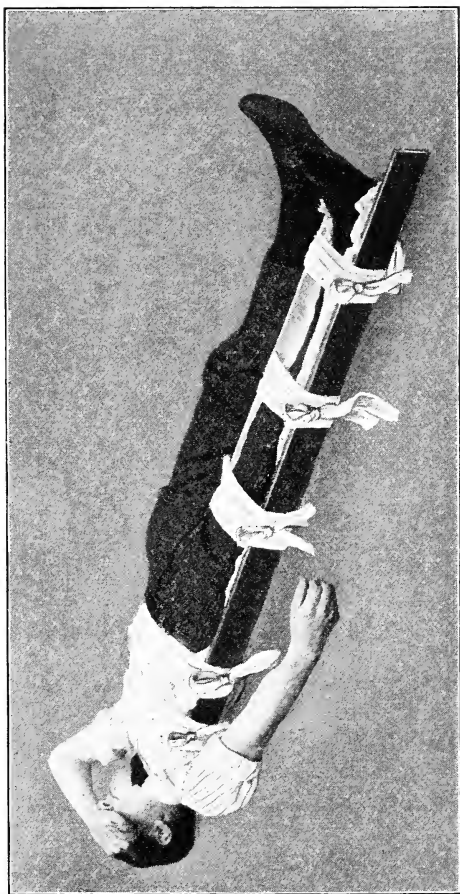


FIG. 9.—Dressing for fracture of the thigh bone (femur).

method is to apply two splints extending to the knee, one on the outer, the other on the inner side of the thigh; then a *long splint*, extending from the armpit to a little beyond the heel, and another from the crotch to the heel. This should be bound on with five or six broad bandages: one round the chest (with an extra turn round the splint); one around the hips, another round the thigh, another round the knee, and another at the ankle. (See Fig. 9.) Two other bandages may fix the sound limb to the injured one as an extra support.

Fracture of the Knee-pan. In fracture of the knee-pan (or knee-cap) the whole leg must be bound to a straight splint placed at the back of the limb and going from the hip to the heel. A folded towel, or other pad about three inches thick, should be placed in the hollow at the bend of the knee, so that the leg may not be held absolutely straight; for this position soon becomes very painful. The part under the heel must also be well padded. Then the whole leg should be raised at an angle of about forty-five degrees with the body, and supported with pillows, after which cool, wet cloths should be applied to the knee to lessen the irritation always present.

Fracture of the Leg below the Knee.—In this fracture the leg should be drawn down and placed

in a natural position, using the sound leg for comparison. Then a pillow should be placed under it. Broad bandages should be passed under this and tied together over the limb, so as to draw the sides of the pillow pretty firmly up against it. (See Fig. 10.) A light piece of board, or several such pieces, may be bound on afterward to secure greater steadiness, or the other leg may be used as a splint by binding

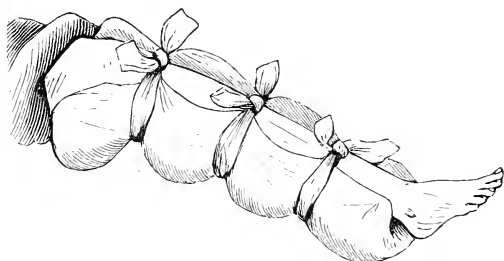


FIG. 10.—Pillow-splint for injuries of the leg.

the injured one to it. If both bones are broken, extra care must be taken not to bind the leg too tight. If splints can be obtained, two should be used, one on each side of the leg, preferably from the middle of the thigh to the heel, well padded and bound on with strong bandages, the knots being fixed over one of the splints and not over the leg. (See Fig. 11.)

In Fracture at or near a Joint it is best to bend the limb a little and lay it flat on a pillow, keeping it cool and moist. Breaks at or near a joint are especially serious, and demand the best skill that can be obtained.

Fractures of Bones that lie deep in the Body, like the hip-bone or the shoulder-blade, are, fortunately, very rare. They are hard to detect, and can

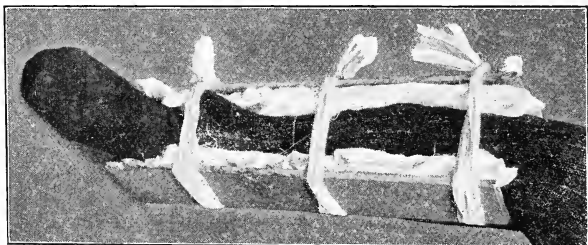


FIG. 11.—Dressing for fracture of leg (tibia or fibula).

be treated only by placing the sufferer in a comfortable position and securing rest and coolness until a surgeon comes. If there is much pain, opium in some form should be given—a tablespoonful of paregoric or a half teaspoonful of laudanum, to an adult.

Fractures of the Ribs must be treated in the same way. It is a good plan, however, to put on

the side of the chest where the break is, long strips of sticking-plaster, about two inches wide, placed parallel to the ribs and applied very snug, beginning at the lowest part of the chest and going up, each strip being made to overlap the one below about half its width. The strips should extend from the spinal column to a little beyond, and to the sound side of, the breast-bone. This makes the chest-wall more rigid, and prevents the rubbing together of the broken ends of the bone. (See Fig. 12.)

In Fracture of the Collar-bone the patient should be laid on his back, on a hard, flat, hair mattress, or on a settee, with a folded blanket under him (never on feathers), without any pillow, and should be kept so until the surgeon comes. This is one of the best ways to treat a broken collar-bone even until it is quite healed.

If a patient has to be moved before a surgeon can attend him, and he can not lie flat as just

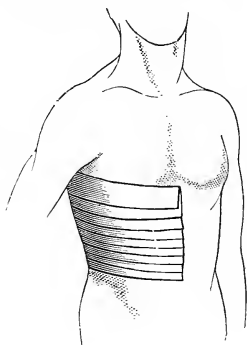


FIG. 12 —Adhesive strap dressing for fracture of the ribs.

recommended, it will be well to brace his shoulder back with a handkerchief or bandage, making what is called a "figure 8," (see Fig. 13) or with a hand-

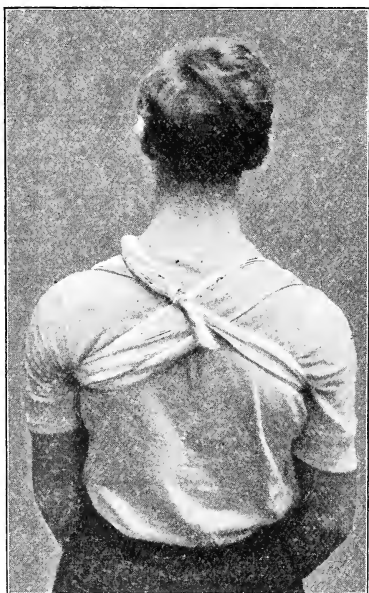


FIG. 13. Dressing for broken collar-bone.

kerchief looped round each shoulder and a third to draw the loops together at the back. Another good

temporary dressing is made by placing a pad in the arm-pit and bandaging the arm to the side with a support passing from below the elbow of the injured side diagonally across the chest and the back and over the sound shoulder, while another bandage goes round the lower part of the chest and binds the arm to it. In the absence of good bandages this may be done with strong handkerchiefs or pieces of muslin.

In Fracture of the Jaw, the parts of the bone should be put in position as nearly as possible, using the rows of teeth as a guide. Then the jaws should be closed and a bandage applied, so as to keep the two rows of teeth against each other. (See Fig. 14.)

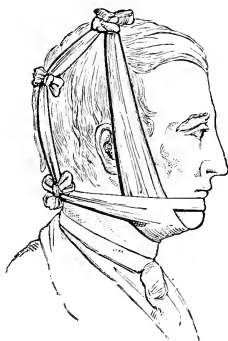


FIG. 14.—Bandage for fracture of the lower jaw-bone.

In Fracture of the Skull there is nothing the non-medical can do better than to place the patient on his back, with the head very slightly raised, and to apply cold wet cloths to the head. If much time must elapse before a surgeon comes, it is well to give a brisk purge, like castor oil, or an injection, so as to get the bowels well cleaned out.

Fracture of the Spinal Column (broken back) is often hard to detect. But if one be suspected, the patient must be moved as little as possible. He had best be laid flat upon his back, and, if possible, he should not be disturbed until the surgeon directs it. Turning such a patient over upon his face may prove fatal, and must not be permitted.

Compound Fractures, as has been remarked, are those in which there is an open wound communicating with the broken ends of the bone. They are to be treated, in an emergency, like simple fractures in the same locations, with the additional precaution that they must be thoroughly cleansed with boiled water containing a teaspoonful of salt to each pint, and kept clean, and the greatest care must be exercised to keep the sharp edges of the bone from doing any further damage.

In all Fractures, cloths wet with cool water may be applied to the surface, so as to prevent, as far as possible, the swelling which usually comes on soon after a fracture, and which often interferes very much with the examination of the surgeon.

Splints.—There is nothing in which there is a greater call for ingenuity and fertility of resource than in extemporizing splints for broken bones. Pasteboard, leather, shingles, pieces of cigar box—anything fairly smooth and stiff—may be used. A

surgeon at the seashore once got himself no little credit by setting a broken arm on the beach, folding up and using as a splint a large newspaper which he had been reading. The chest usually serves as a very good splint for the arm; and when a leg is broken, the other one will make a good temporary splint (Fig. 15), or a coat-sleeve, or a leg of a pair of trousers, stuffed with grass or hay, may prove serviceable.

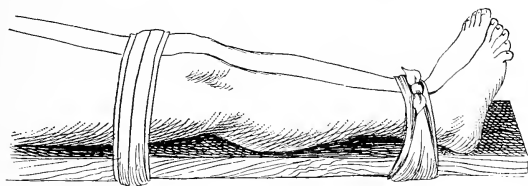


FIG. 15.—Temporary dressing for injury of the legs.

In almost all fractures of long bones surgeons have to use “extension,” that is pulling a limb grasped below the fracture while another person pulls the other way grasping the part above the fracture. This is to overcome shortening or overlapping. A judicious use of the same measure may prove useful in the hands of an amateur.

Antiseptics.

In the treatment of wounds, modern surgery aims to secure freedom from microscopic organisms, belonging to the vegetable kingdom and commonly called "germs," which are likely to be harmful. The first step in the method, which is somewhat in-exactly called the "antiseptic method," consists in making the surgeon and all his assistants germ-free. In like manner any amateur who undertakes the treatment of a wound should prepare himself by as thorough a cleansing of his hands and nails as the circumstances permit. The second step in scientific surgery is to cleanse a wound with certain chemicals. Of these few are likely to be available to the amateur; but happily one of the best is the simplest, namely, a solution of salt in water—two or three teaspoonfuls to the quart—with which any wound may be well cleansed. The next step in scientific surgery (after a wound is ready for dressing) is to cover it so that new "germs" may not reach it. For this the amateur should use dressings made germ-free by means of heat. In haste

any dressing may be made practically germ-free by baking in a hot oven for an hour, by hard boiling for five or ten minutes, and (in a pinch) by ironing with a very hot iron. Of all known antiseptics, turpentine is probably the best for emergency work ; and a wound cleansed with salt solution and then dressed with gauze or muslin pretty well saturated with turpentine is properly treated. Beside turpentine, alcohol or vinegar may be used with good effect—or plain brewer's yeast.

Wounds.

In studying wounds we shall adopt the classification customary in works on surgery, viz., contusions, and contused, incised, lacerated, punctured, poisoned, infected, and gunshot wounds.

Contusions are what are usually known as bruises, and almost all wounds of the soft tissues caused by blows. They are sometimes very painful, and are often followed by discoloration, due to the escape of blood under the skin from the small vessels of a part. A "black eye" is a familiar example of an injury of this sort.

Contusions are sometimes very simple; as in the illustration just given. Such contusions are best treated at first, when painful, by the application of cool, wet cloths, or with some simple ointment like vaseline or cosmoline or cold cream. Pure laudanum, or laudanum and water in equal parts, is often a very acceptable application. Later, when the pain has subsided, *hot*, wet cloths are best, as they favor the carrying off of the blood that has escaped.

Contusions of the Chest or Abdomen may be very serious; for, besides the external bruises, important internal organs may be injured. Evidence of this may be seen in spitting or vomiting of blood, or in its passage from the bowels or from the bladder; or it may be shown by the occurrence of great depression. In such cases little can be done by the non-professional person beyond securing complete rest and sustaining the strength of the sufferer by means of warmth applied externally and careful stimulation internally, as described in speaking of "Shock"—to which reference may be made.

Contused Wounds.—These are cuts or tears accompanied with bruising of the tissues. They are to be treated like lacerated wounds. (See p. 85.) Unless they bleed freely, and if they are severe, warm applications are better suited to such wounds than are cold ones. It is important, when dirt of any sort has entered a wound—as in many scratches—to prevent this from being sealed up in the tissues by nature or by art. In such cases moist applications, and especially simple ointments should be applied for several days. The implicit confidence surgeons generally repose in antiseptics sometimes leads them to overlook this point in apparently trifling injuries, with unfortunate results to the patient.

Incised Wounds, or plain cuts, if simple and small, call only for cleansing and a piece of sticking-plaster, and perhaps a bandage. If large, the edges should be brought as near together as possible, and supported so with strips of adhesive plaster (as shown in Fig. 16),* or bandages, or the hands, until the coming of a surgeon.† If an entire part be cut off, such as an ear, or a nose, or a toe, or a finger, it should be cleaned with lukewarm water or salt solution, and put in its place, and kept warm, leaving to the surgeon the decision whether or not it is worth while to try to save it. Some very remarkable cases of reunion of such parts are on record ; and an attempt to save them is not to be lightly rejected.

Any person with fair skill and some nerve may stitch a wound, if it seems necessary, using a clean needle and plain black silk or cotton thread that have both been boiled for five minutes, and taking care to pass the stitches quite through the skin, and to adjust the edges accurately. Hairy parts should be shaved before sticking-plaster or stitches are used. On the head, long hair may sometimes be used to tie

* The best water-proof plaster is a "Kid Arnica Plaster." This will remain attached (if properly applied) in spite of repeated washings of the surface. The best adhesive plaster now made is that called ZO plaster, which requires no heat for its application.

† Adhesive strips should never entirely cover a wound ; but free spaces should be left between them and at each end of the wound.

across the wound, so as to bring its edges together. Stitches should never be put in the scalp, and rarely anywhere else. Many painful stitches and unsightly scars would be spared if the possibilities of ingenuity and adhesive plaster were fully understood.

Cuts of the Walls of the Abdomen are often followed by protrusion of a portion of the bowels.

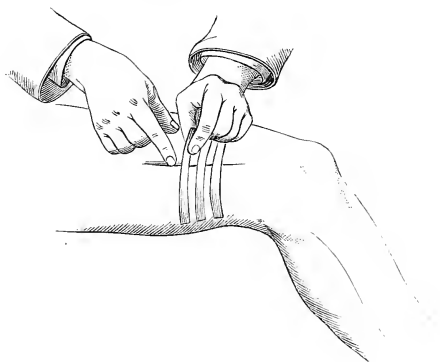


FIG. 16.—Method of applying adhesive straps to a wound.

This, if dirty, should be cleansed with warm salt solution, and a gentle effort should be made to restore it to its place. If this fails, it should be covered with a clean white cloth soaked in warm salt solution. The cloth should be kept warm and wet by constant or frequent applications of the solution.

Cuts of the Chest Wall may rarely be followed by escape of a portion of lung. This should be treated in the way just described for escaped bowel, except that no attempt should be made to push the lung tissue back ; for this is more likely to do harm than to do good.

Cut-throat Wounds usually require, in addition to the ordinary treatment of the wound, that the head shall be bent forward, with the chin close to the breast-bone, and kept there.

The way to wash delicate structures, such as the intestines, or raw cut or torn surfaces, may be described here, as it is a good plan to learn to do such things by practising them before the emergency arises. Dip a new, or thoroughly boiled, sponge, or a quantity of aseptic absorbent cotton, in pure water or salt-solution, and hold it in the closed hand, with the thumb uppermost, and a corner hanging below the fist. Now, on squeezing regularly, a single stream of water will flow softly and steadily down from it. The size of this stream can be regulated by the way the squeezing is done, its force by the height to which the hand is raised. This is the only way to clean delicate tissues that is safe in the hands of the unexpert.

In cuts near a joint, it is often well to apply a splint and bandage to keep the joint stiff.

Lacerated Wounds are tears with ragged or blunt edges, such as are often caused by machinery, bricks, clubs, timbers, stones, dull tools, glass, hooks, etc. These often require surgical skill. Until it can be obtained, the torn parts should be washed in the manner described above, so as to remove any foreign matters that can be so dislodged, after which they may be placed as nearly as possible in their natural position, and covered with a cool, wet cloth, or a cloth soaked in laudanum or alcohol. If the tear has been very great, and the sufferer is depressed and cold, teaspoonful doses of brandy or whiskey in hot water may be administered, and a cloth wrung out of hot water may be placed over the injured parts.

Punctured Wounds are made with sharp-pointed objects, like pins, needles, nails, tacks, fish-hooks, thorns, splinters, or glass.

Pin Wounds rarely do much harm ; but if they are the cause of anxiety they may be well squeezed while held in quite hot water, so as to provoke a rather free flow of blood, which will wash out any poisonous matter that may have been deposited in the wound.

If a Needle is run into the flesh and comes out, it should always be examined carefully ; and if any part, from point to eye, is missing, a surgeon

should be called. Meanwhile the wounded part should be kept perfectly still, and no attempt should be made to remove what remains. This would probably be quite in vain, and would only increase the difficulty of the surgeon's work when he arrives. The broken needle should be carefully kept and shown to him, as he will then know better what to look for in his examination.

Wounds made with Nails or Tacks must be treated by first making sure that no part of the nail or tack remains in the wound. After this it is often desirable to slightly enlarge the opening in the skin, to put the injured part in hot water, and to squeeze some blood out. Then some simple ointment should be applied to keep the wound soft and open for a few days.

If a Fish-Hook is caught in the flesh, the best thing to do is to cut off the string, to push the point of the hook through, and to draw it out, like a needle in sewing. The broad part of the hook may have to be cut off before trying this. This may be done with a strong pair of nippers or cutting-pliers (such as bellhangers use), or by means of a strong knife and a hammer. The latter method is, however, an exceedingly painful one. After removing a fish-hook, the wound should be treated as wounds with nails or tacks.

Thorn Wounds should also be treated as wounds with nails or tacks.

Splinters are dangerous in proportion to their size and according to the part they enter. Small splinters may be picked out with a needle, or cut out with a sharp knife.

Splinters under the nails sometimes defy attempts at removal by the non-medical. But the way to succeed is to soak the nail in hot soap-suds, and then to scrape it *as thin as possible* over the splinter, with a piece of glass or a sharp knife, and to split it, or cut a little tongue out, so as to get at the splinter. If, after this, the splinter can not be removed, it will more easily come away of itself when matter forms; so that, in any case, the sufferer will be better off for submitting to the little operation.

Splinters in the eye should be pulled out, if possible. If they can not be removed at once, a few drops of oil should be put in the eye, the eyelid should be gently closed, *both* eyes should be covered with a layer of cotton soaked in cool water, and a bandage should be placed round the head, so as to keep the lids as still as possible. This bandage should not be too thick or be put on too tight, and the application should be kept cool—with ice-water, if need be.

If a large splinter enters the body, an attempt may be made to pull it out ; but a surgeon should be called without fail, and whatever of the splinter has been extracted should be carefully saved and shown to him. This will aid him in making up his mind whether or not the removal has been complete, and perhaps save much pain and danger to the patient. Splinter wounds may often be advantageously treated like nail wounds.

Glass Wounds should be treated by removing the fragments as far as possible, and applying a cool and moist dressing.

Poisoned Wounds are usually punctured wounds, inflicted by snakes, or insects, or other animals.

Bites of Venomous Snakes (Serpents) require instant cauterization and the prompt removal of the flesh immediately surrounding the wound. It may be cut out by any one who has the nerve to do it. Before this the part should be encircled, above the wound, with a pretty tight ligature, and, if small enough, it should be thrust into the mouth and sucked hard, so as to extract the poison—the mouth being well rinsed out afterward ; or it may be soaked in hot water and squeezed, so as to get some blood out. The immediate application of hartshorn to the wound is of advantage ; and a knitting-needle or nail, heated to redness, may be thrust into it. At

the same time, whiskey should be given in doses large enough to cause moderate intoxication.*

Stings or Bites of Bees, Wasps, Hornets, Tarantulas, Scorpions, Centipedes, Spiders, etc., are to be treated with cool, moist dressings, and hartshorn applied to the point where the sting entered. The sting should be removed, if it can be.

The stings of insects are rarely dangerous to life. They may be treated with cold, wet applications—wet earth is a very good one. The application of a few drops of laudanum, or hartshorn, or some wet salt, or a slice of onion often gives great relief.

Bites or Scratches of Cats and Rats, if neglected, may be followed by severe inflammation, because of the filthy condition of the mouths and nails of such animals. They should be treated by simply cleansing the wounds, sucking them, perhaps, or squeezing them under hot water, and applying a simple ointment to them for a time.

Bites of Dogs may be followed by a local irritation, like those of cats or rats. Beside this they cause a special terror to some persons, while others have little fear of them, though often bitten. If any one is bitten by a dog in good health, only the simplest

* This recommendation is open to objections that need not be stated here. It is a popular method of treating snake bites, and it is of real service in many cases, because it tends to remove the element of fear which, in snake wounds, contributes largely to their serious results.

treatment will be necessary. If the dog is sick, local inflammation or severe constitutional disturbance may follow. In case of reasonable suspicion, the wound may be thoroughly cleansed and an application of hartshorn made to it, in addition to energetic sucking or soaking under hot water to extract any irritating material which may have entered it. Dog bites should *never* be cauterized with lunar caustic (nitrate of silver). This is so generally done by druggists and at hospitals that the author must state that more than twenty years of exhaustive study of the subject and a large experience have convinced him that such cauterizations are worse than useless. They never do good and often do harm.

Further, persons bitten by suspected dogs or cats should not be sent to so-called "Pasteur Institutes." For this there are several reasons. One is, that there is no trustworthy evidence that all such institutions are honestly conducted, while there is ground for the belief that some of them are arrant impostures; another is, that a large number of persons have come to their death from the treatment received in such institutions. And, finally, more persons have died of so-called hydrophobia, and of the laboratory disease caused by the so-called preventive inoculations, since Pasteur Institutes were founded,

than died, in an equal time, before the introduction of this dangerous innovation.

It is a most foolish thing to kill a dog that has bitten anybody soon after this has taken place. Such a dog should be caught and kept well cared for under the observation of a person of carefulness, intelligence, and special information. If it lives for two weeks, it is safe to say it was not "mad." The too speedy slaughter of a dog has robbed many a sufferer of the assurance that would have been gained by seeing it living and well, and has sent many a one to the grave, as dying of hydrophobia, who never had it, but had been bitten by an excited but healthy animal.

Again, if one has been bitten, and there is a reasonable suspicion that the dog was what is called "mad," let him not despair. Most, if not all, cases of so-called hydrophobia are not hydrophobia at all. The author has studied this subject with great care for many years, and has become satisfied that the popular theory in regard to hydrophobia is utterly wrong. He also believes it will some day disappear, as the belief in witchcraft—which not long ago was supported by the most respectable medical, clerical, and popular authorities—has disappeared. In most of the reported cases the patients have been alarmed by what they thought, or frightened by what injudicious

friends or timid doctors have said and done, until they died of sheer terror. So much nonsense is believed about hydrophobia by medical men who have not carefully studied the subject, and so much talk about it goes on among the laity, that it is no wonder it is much dreaded by old and young. Children learn about its horrors nearly as soon as they can walk, and no age is secure against a belief in it. But those who see the most dogs liable to be rabid have the least belief in hydrophobia. Keepers of public pounds, dog-catchers, and keepers of kennels in large cities, may be said to never develop hydrophobia though bitten innumerable times. So, in case of a bite from a supposed mad dog, let the things suggested above be done; and let the bitten person reflect how common are dog bites and how very few are the cases of so-called hydrophobia.*

Infected Wounds are those poisoned by certain injurious materials. If not promptly corrected this infection will cause a local inflammation and may cause a serious constitutional affection. Infected wounds should be thoroughly opened and cleaned

* So-called hydrophobia exists exactly in proportion to the common belief in it and the amount of public discussion it gets. In Paris more cases occur than in any place of its size in the world, because there the medical men are continually keeping the subject before the people. In this country a few newspapers more or less constantly do the same thing.

out, and then kept open for a few days at least, to permit the discharge of the infecting agent. The occurrence of a chill and fever shows the need for systemic treatment, the best of which consists in clearing out the bowels and giving quinine in doses of five grains thrice daily to an adult, and half this to a child.

Gunshot Wounds (Bullet Wounds).—For these wounds little can be done at first except to note and remember the position of the body, or of the wounded part, at the moment it was struck, and the direction from which the missile came, so that these facts may help the surgeon in his search for it.* Then cold, wet cloths, upon which laudanum may be poured, should be kept upon the wound, to prevent, as far as possible, inflammatory swelling ; and if, as is very often the case, the patient be in what surgeons call a state of shock—that is, cold and depressed—teaspoonful doses of wine, whiskey, or brandy should be given, and warmth should be applied to the surface of the body. (See “Shock,” p. 98.) If a part is badly shattered, the local treatment should be the

* The strange course a bullet may take is shown by the case of a young man shot, in 1876, with a pistol ball which passed through his lower lip, struck an upper front tooth, which it broke off, then glanced downward and backward, diagonally through the tongue, and finally buried itself in the floor of the mouth, on the other side from that where it entered the lip.

same, except that, if there is much depression, cold had better not be used at all. There is rarely much bleeding from gunshot wounds, except when large vessels are divided. In such a case the bleeding should be controlled as described under the head of "Hemorrhage."

Railroad and Machinery Accidents.

Railroad and Machinery Accidents may occasion simple incised, contused or lacerated wounds, or severe tears, wrenching off of fingers or toes or limbs, or crushes. Such injuries often occur when medical aid cannot at once be obtained; and some one on every train, and in every establishment in which machinery is in motion, should have an idea of what can be done before a surgeon can be had.

Trifling Injuries, whether cuts or tears, are to be treated on the principles described in speaking of incised or lacerated wounds. (See pp. 82 and 85.)

Bleeding is not usually severe after railroad and machinery accidents, because the wounds are generally inflicted in a way that closes the blood-vessels as they are torn or twisted off.

Large Tears, or Lacerations, must be treated by carefully removing fragments of clothing or dirt or splinters from the wound, and washing as described on page 84. For removing foreign matters, the best pair of forceps is a finger and thumb; and no

one need be afraid to use these with reasonable care, after washing them very clean. They may be aided occasionally by touches with a clean linen or muslin cloth or a clean sponge or small mass of cotton.

After cleansing is complete, the torn parts should be anointed with clean oil and put in position, and kept so by bandages, adhesive plaster, or the hands of another person, as may seem best. Sometimes a splint is required. This is usually easy to prepare in a mill or on a railroad. It may be clumsy—that is not of much consequence—but it ought to be sufficiently large to keep still not only the injured part, but also, in case of a limb, the joint above and the joint below the injury. (See “Splints,” p. 76.)

Such injuries often cause comparatively little pain. If there should be severe pain, laudanum may be given—about thirty drops to an adult. Cold or hot cloths, whichever are most comforting, should be applied to the injured part, and symptoms of depression should be treated as described under the head of “Shock.” (See p. 98.)

When Fingers or Toes are Crushed they should be washed, modeled into good shape, covered with oil, and dressed with a piece of soft, white cloth which has been wrung out of hot water, and bound upon a splint.

If a finger or toe hangs by a mere shred, it may

be cut off entirely. If there seems to be any life in it it may be put in position and treated as described on page 82.

When Fingers or Toes are Torn off the stumps almost invariably require a scientific amputation. But, until this can be decided upon, they should be cleansed, and treated with a cool, wet application of some sort, and then not be meddled with.

Crushed Hands or Feet should be treated by being bathed with clean oil and wrapped up in a soft, warm dressing, like cloth or cotton or wool. Cold is to be used only if there is profuse bleeding. The injured part should invariably be supported with some sort of splint and placed about on a level with the body. One who has received such an injury should be made to lie down, unless some other course is absolutely necessary for moving him or is authorized by a surgeon. Such injuries rarely cause much pain, but they almost invariably cause great depression. This should be met by keeping the sufferer warm with wraps and hot water-cans or bricks or bottles, and giving him every ten minutes a teaspoonful of whiskey or brandy in a little hot water. Larger doses of spirits are not needed. (See "Shock," p. 98.)

When Hands or Feet have been Torn off or cut off with wheels, the stumps should be treated as

described just above, with the limbs placed in such a position that the injured point is higher than any other. These injuries are usually accompanied with depression also, and this should be combated in the manner described for shock.

Crushed Arms or Legs should be treated like crushed hands or feet. But here the prostration is usually much greater, and the need for support, with warmth and stimulants, is more urgent. The clothing should on no account be disturbed, except in so far as it can be cut away and replaced with warm coverings, or as is necessary to find out the nature of the injury or to control bleeding.

Crushes of the Chest are sometimes instantly fatal, and almost always cause death in a short time. In such cases, as well as in case of

Crushes of the Lower Part of the Body require nothing that can be done besides securing rest, warmth, and moderate stimulation. The sufferer should be made as comfortable as possible, and prepared for the almost inevitable issue.

Shock is a condition which has been alluded to already, in speaking of certain injuries. It may also be caused by fright, as, for example, that which may accompany a trifling gunshot wound, or by a profound mental impression of grief, or even of joy. It may be caused by a blow upon the pit of the

stomach, or by a sudden and severe pain, or even by drinking rapidly a large quantity of ice-cold water. It is very common after gunshot wounds, and almost invariable after serious railroad or machinery or mine accidents.

The signs of shock are : paleness, a cold, clammy skin, a feeble pulse, feeble breathing, a pinched face, dull eyes, drooping eyelids, dilated pupils, bewilderment or dulness of mind, or even insensibility. A person in such a state may die very soon, and will surely die before long, unless he can be brought out of the shock. This requires prompt, energetic, and persistent effort on the part of those who come to his assistance. Warmth should be applied, if possible, to the whole body, and especially to the region of the heart and pit of the stomach. This can be done by means of a hot bath, a hot fire, hot cans, hot bottles, stove-plates, heated dry or wet blankets—in fact, anything hot that can be got hold of.

In applying heat, care must be taken not to burn the patient ; for in a state of shock he may not feel pain from an amount of heat which would severely burn him.

At the same time hot drinks, to which brandy or whiskey has been added, may be given. A teaspoonful of brandy or whiskey in a tablespoonful of

hot water may be given every ten minutes for several hours. Larger quantities do no more good, and may do harm.

Manufactories, mines, and railways should be furnished with appliances for the treatment of shock and some one who knows how to use them ; for shock almost always follows severe railroad or machinery accidents, and is the most common cause of death after them.

Hemorrhage—Bleeding.

There is no accident so appalling as hemorrhage, and none that calls for more nerve in combating it ; nor is there any in which a little accurate knowledge can be more valuable.

The subject of the control of hemorrhage will be better understood after taking a concise view of the anatomy of the organs of circulation. This can not be made absolutely accurate here without being too technical ; but the variations from accuracy will not affect its practical utility.

The blood starts from the left side of the heart, and is driven first into the aorta, which curves over backward above the heart and descends along the left side of the spinal column, within the chest and abdomen. From what is called the arch, at the beginning, are given off the vessels that supply the head and arms. The former (the carotid arteries) lie, one on each side of the windpipe, and divide in various directions. The latter curve forward and come out from the chest over the first rib, passing

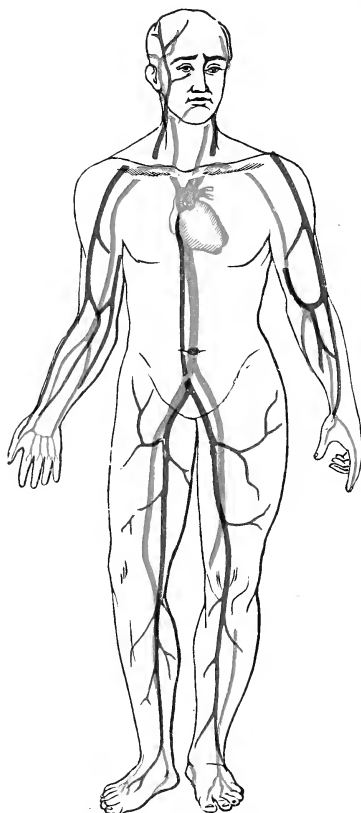


FIG. 17.—Showing the Course of the Principal Blood-vessels.

under the collar-bone near the shoulder, and down through the arm-pit and along the inside of the arm to the middle of the front of the elbow (the brachial artery), where each divides into two main branches. These extend along the front of the forearm, one on the thumb side (the radial artery), and the other on the little finger side (the ulnar artery). Thus, in the upper arm, the arteries follow nearly the same line as the seam in a coat-sleeve. The two arteries of the forearm, entering the palm of the hand, join in two loops, from which vessels run down, one on each side of each finger, and one on the inner face of the thumb.

The aorta, as it descends through the chest and abdomen, gives off vessels to supply the internal organs, and near the lower end of the backbone divides and sends a large vessel (the femoral artery) out through each groin into the thigh. Each of these passes down in almost a straight line, between the muscles, to the middle of the hollow at the back of the knee. Just below this it divides into three branches. The first of these (the anterior tibial artery) passes through to the front, between the two bones of the lower leg, and runs down under the muscle, close to the outer side of the shin-bone, and passes out upon the instep at about the middle of the front of the ankle-joint. Here it

breaks up into smaller vessels that supply the upper surface of the foot.

The second and third branches of the main artery of the thigh pass down the back of the lower leg, one on each side, close to the corresponding bones and deep under the muscles. One (the posterior tibial artery) passes back of the inner ankle-bone into the inner side and sole of the foot. The other—usually smaller—branch (the peroneal artery) passes back of the outer ankle-bone to the outer side and sole of the foot. The arteries of the sole of the foot, like those of the palm of the hand, unite to form a loop, from which a vessel is given off for each side of each toe.

This is a brief outline of the course of the arteries. As they divide and subdivide, like the branches of a tree, they become correspondingly smaller, and they end in a fine network of minute vessels, called “capillaries.” Then, as the capillaries are a sort of splitting up of the smallest arteries, so, on the other hand, by the confluence of a number of capillaries, larger channels are formed, toward which the current of blood constantly sets, and the beginnings of the veins are formed.

The veins unite in a manner the very reverse of the branching of the arteries, and, growing, like rills and brooks and rivers, larger and larger by

repeated junctions of several into one, extend back to the heart in a direction opposite to that of the arteries. Of veins there are two sets: the deep, which lie alongside the arteries, and the superficial, which lie near the surface just under the skin. Each principal artery has at its side at least one vein of corresponding size. Up the legs, up the inside of the abdomen and chest, up the arms and down the neck they pass, until they unite to form one trunk, which empties into the right side of the heart.

From this point the blood is pumped into the lungs to be aërated; from the lungs it is collected and emptied into the left side of the heart; and from the left side, as we have seen, it is pumped out, to begin again the circuit through which we have just traced it.

The illustration on page 102 will give a fair idea of the course of the main blood-vessels, and may make clearer what may not have been understood from the preceding description.

The position of the large arteries is always in the safest part of the body or limb. They all lie where they are protected by bending a limb or a joint—a natural act when attacked. They are on the inner side of the arm and palmar side of the forearm, the inner side of the thigh, and the back of the leg—

out of harm's way. In endeavoring to check bleeding by pressing upon a main blood-vessel, this fact may serve as a reminder of the course it might be expected to run. To which this suggestion may be added, namely: When in doubt, one should feel for the pulsation of the artery and make pressure where its beat is found. Another point, preliminary to considering the methods of arresting hemorrhage, is that blood from arteries is usually bright red and escapes in jets,* while blood from veins is dark red or purple, and flows in a steady stream. Blood from capillaries is of a color between these two, and it oozes out.

Capillary Hemorrhage follows every cut. The color of the blood is red; the flow is generally slow and not very considerable. It usually stops of itself. If it does not, the part may be elevated, and cold water or ice or snow or even vinegar may be applied. If there is oozing from a large raw surface, a towel may be folded, dipped in water as hot as the hand can possibly bear, lightly squeezed, so as not to drip, and firmly pressed upon the bleeding surface. This may have to be renewed once or twice, at intervals of a few minutes, but it usually acts like magic in this form of hemorrhage.

*In deep wounds spurting at the surface may be prevented by the overlying tissues.

Hemorrhage from the Veins is generally slow and steady, and the blood is dark. When severe bleeding occurs the patient should lie flat on his back, when the application of cold, and firm, continuous pressure upon the wound will generally stop it. A folded linen or muslin cloth, bound on dry, with moderate firmness, or direct pressure with a finger, will usually stop any bleeding from a vein. Rupture of varicose veins in the legs may lead to dangerous hemorrhage, but this can usually be checked by applying a pad of dry cloth and binding it firmly down upon the bleeding spot. In this case a ligature applied *above* the wound would make the matter worse; for the blood passes up in the veins and not down.

A wound of the jugular vein, on the side of the neck, is usually followed by dangerous hemorrhage. This is to be treated with a pad and direct pressure. The latter is best made with one finger applied above and one below the wound.

Hemorrhage from the Arteries may be very dangerous. Here the blood is bright red, and spurts or comes in jets, from the divided vessel. If it be from a large artery, like those in the root of the neck, or the armpit, or the inside of the thigh near the groin, life will usually be quickly lost. Indeed without a thorough acquaintance with anatomy, little

use could be made of any advice that could be given here. The only thing to suggest is to thrust a thumb or finger deep into the wound, and to try if firm pressure there will stop the bleeding. Or a plug of cloth or cotton may be tried. In all cases of hemorrhage that has stopped or is stopping, clots should



FIG. 18.—Course of carotid artery and its branches in the face.

never be disturbed, for they are Nature's means of checking hemorrhage. These and fainting sometimes put a stop to bleeding, and aid the professional or amateur surgeon.

When an artery in a limb is cut, the helper must be as cool as possible and as quick as is consistent

with coolness. The principle that must guide every attempt to stop the bleeding is to obstruct the artery



FIG. 19.—Deep pressure with the thumb over the carotid artery in the neck.

at the spot, or between the cut and the centre of the body; for this is the direction in which the blood flows.

For Wounds high in the Neck deep pressure should be made with the thumb at the root of the neck, just outside the windpipe and near the collar-

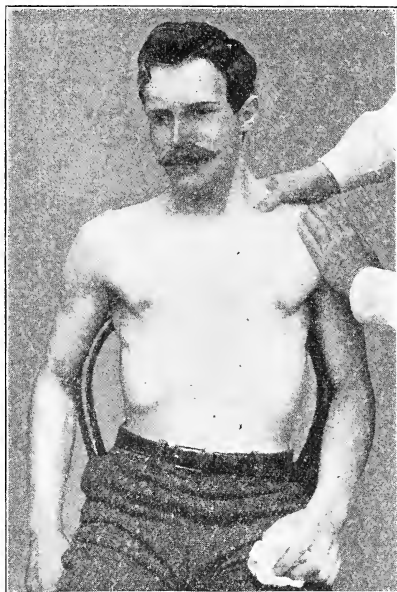


FIG. 20.—Deep pressure over the artery behind the collar-bone (subclavian artery).

bone, pressing the carotid artery back against the spinal column in the neck, as shown in Fig. 19.

In Wounds of Arteries of the Face or Scalp bleeding may be checked by direct pressure over the wound, or by pressure against the middle of the

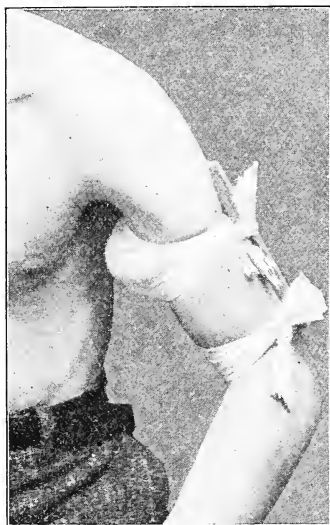


FIG. 21.—Spanish windlass on upper arm. The lower bandage keeps the stick from untwisting.

lower jaw, where the artery crosses it below the angle of the mouth, as shown in Fig. 18; or before the ear, above the angle of the jaw.

In Wounds about the Shoulder or in the Arm, strong pressure may be made downward, behind the



FIG. 22.—Compression of brachial artery with pad in armpit and bandage round chest.

collar-bone, near its middle. (See Fig. 20). The thumb, or the handle of a large door-key, well

wrapped, so as to make a tolerably thick mass, can be thrust down ; and if it does not seem to strike the artery the first time, it can be moved along, toward the breast-bone and toward the shoulder, to see if it will hit the right place.

In Wounds of the Upper Arm direct pressure may be used ; or the main artery may be compressed above the wound, with the thumb or the fingers, by deep, strong pressure forced down to the bone, about the middle of the arm and at the inner edge of the biceps muscle. Or a “Spanish windlass,” may be applied, as shown in Figure 21, or a firm pad may be placed in the armpit and forced against it by binding the arm to the chest (see Fig. 22).

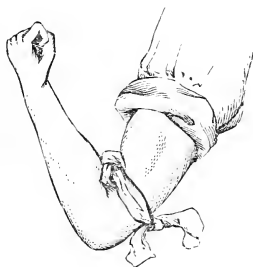


FIG. 23.—Pressure by knot over artery at the bend of the elbow (brachial artery).

In Wounds of the Forearm direct pressure should be applied to the wound and the main artery should be compressed above the elbow, as in wounds of the upper arm, or it may be compressed at the elbow by placing the knot of a large handkerchief there and bending the forearm forcibly up against it, as shown in Fig. 23.

In Wounds of the Hand, raising this above the head and making firm pressure on the bleeding spot, or with both thumbs—one on each side and in



FIG. 24.—Pressure with thumbs over arteries at the wrist (radial and ulnar arteries).

front of the wrist—will usually stop the bleeding. (See Fig. 24.) Or the wound may be packed with lint or cotton or old muslin or linen and bound

firmly with a bandage. If this fails, resort must be had to the measures recommended for hemorrhage from the forearm.

In Wounds of the Finger, pressure may be made on the side that is cut, by seizing the finger between a thumb and finger and pinching it, or by applying a firm pad and bandage. In wounds of the thumb, pressure must be made on *the front* of the injured parts—not at the side.

In Wounds of the Thigh pressure should be made in the hollow immediately below the groin about two-thirds of the way from the hip-bone to the middle line of the body, where the artery of the thigh (femoral artery) comes out of the body, as shown in Fig. 25. This can be effected in any of the ways recommended for wounds in the upper arm—remembering the course of the artery in the thigh. The artery may also be closed by placing in the groin a knotted cloth, or a large round stone, and doubling the leg back on the thigh (this is important), and the thigh forward, hard against the abdomen. If this latter plan does not succeed promptly, some other one of those mentioned should be tried, and no time be lost in doing it.

Wounds of Arteries of the Lower Leg may be treated with firm pressure in the hollow just behind the knee (above the calf of the leg). This can be

effected by placing there a knotted cloth, like that suggested for the armpit, and doubling the leg

back until it presses hard against it. In doing this, the thigh must be doubled up toward the abdomen, or the bending of the knee will soon become intolerably painful.



FIG. 25.—Deep pressure with thumbs over main artery of the thigh (femoral artery).

For Wounds in the Foot the treatment is that for wounds of the lower leg, with direct pressure on the wound. The bleeding may sometimes be controlled by a pad firmly applied just behind the inner ankle-bone and another over the front of the instep just below the ankle-joint (Fig. 26).

Recapitulation. — In treating hemorrhage from the arteries one should remember, first, to keep cool; second, that unless direct pressure at the wound checks the bleeding the artery must be

obstructed above the cut, and that this can be effected by pressure in the course of the vessel, and often quite successfully by pressure in the bend of the



FIG. 26.—Position of pads to compress arteries of foot (anterior and posterior tibial arteries.)

elbow, in the armpit, in the bend of the knee, or just below the groin. Pressure can be made with the fingers, or with a knot held hard against the artery

with a tight bandage, or by bending the limb up against it—or, in case of the arm, by pressing it hard against the chest. In case of failure, the “Spanish windlass” should be applied at the same points.

The “Spanish windlass” is made as follows: Place some hard, round body, like a stone, in the large part of a handkerchief folded diagonally into a cravat, or knot the middle tight, and carry the ends round the limb, so as to leave the lump over the position of the artery. Then tie the ends so as to make a loose loop, slip a stick through this, and twist it* round and round, so as to tighten the handkerchief, until the blood stops flowing, *but no more!* The end of the stick may be kept from untwisting by tying it to the limb. (See Fig. 21.) This is a rather rough way of checking bleeding; but one can not be over-particular in such cases. So if the former fails, or no bystander is cool enough to carry it out, no time must be lost before the “Spanish windlass” is used but in no case should a tourniquet or “Spanish windlass” be left in place more than an hour without loosening it, to see if it may be dispensed with without recurrence of the hemorrhage.

An effective tourniquet can be made by passing a piece of elastic tubing, or a suspender, or a belt sev-

* Care must be taken not to catch and pinch the skin when the twists are made.

eral times round a limb, stretching the binder as each turn is made, and finally tying the ends so that they shall not slip. Very strong compression can be made in this way, and some judgment is needed, not to make it too strong.

In case none of the plans proposed can be carried out, a cut that bleeds profusely may be stuffed with a rag or dry earth, this being kept in place by pressure with a bandage or handkerchief; or the cut part may be forcibly compressed in any way; or a finger may be thrust into the wound, and held wherever it seems to do the most good.

Finally, let it be remembered that clots are not to be disturbed; that raising a limb will often put a stop to even severe bleeding; and that fainting may put an end to hemorrhage; as well as that when consciousness is restored the bleeding may recur. This possibility should not be overlooked. The treatment of a faint under these circumstances—if it is so grave or so prolonged that it must be treated—is the same as that of any faint: in addition to the measures demanded to check the bleeding, the head must be lowered, the legs and arms may be elevated, and warmth applied to the body, while stimulants are carefully administered by the mouth.

Special Hemorrhages.

Bleeding from the Nose is often only Nature's way of getting rid of an excess of blood ; but it may be so profuse as to threaten life. If this be the case, of course medical aid will be summoned. Until it arrives, the patient must be kept lying down,* and a cold key or a cloth dipped in cold water may be applied to the nape of the neck. If this does not soon stop the bleeding, salt and water (a teaspoonful to a cupful) or vinegar may be snuffed up the nose. A dessertspoonful of alum in a cupful of very warm water is also useful ; but vinegar is less disagreeable, and will rarely fail to check the bleeding, unless the case is beyond any except skilled help. In many cases, a small plug of cotton, pushed about an inch up the nose, will control the bleeding ; and even firmly pinching the nose as far up as it is soft (below the bone) will at times stop a very troublesome hemorrhage. Sometimes a little roll of paper placed

* In this position some temporary annoyance may be caused by blood flowing into the back of the mouth ; but this usually ends soon, as the position alone will often cause a nose-bleed to stop.

between the upper lip and the gum near the nose will check the bleeding.

Bleeding after Extraction of a Tooth is best treated by pressing a plug of dry cotton or one soaked in vinegar or powdered with alum firmly over the bleeding-point, and holding it there with the finger, or by pressure from the other teeth—using a bandage going over the head and under the jaw, if necessary—until a surgeon can be had.

In Hemorrhage from the Lungs the blood is bright red and generally frothy. It is rarely profuse ; and yet, as it is usually coughed up and caught in a handkerchief, it may seem to be so. The amount can never be safely estimated in this way. The best treatment is rest in bed, with the body raised in a half-sitting posture, and the swallowing of lumps of ice. The application of cold to the chest, although often recommended, is rarely advisable. A salt-spoonful of salt and a teaspoonful of vinegar may be given every fifteen minutes. Most hemorrhages from the lungs stop in a little while without any treatment, and they are very rarely dangerous to life.

In Hemorrhage from the Stomach the blood is usually very dark, looking like coffee grounds. If it is mixed with any other contents of the stomach its appearance may be masked. In such hemorrhages, ice-water or broken ice may be swallowed,

and teaspoonful doses of vinegar. Rest in bed must, and the application of cold over the stomach may, be employed.

Hemorrhage from the Bowels may be treated with injections of a teacupful of ice-water, or alum and water, and the application of an ice-bag or ice-cold cloths to the abdomen. Fortunately, these hemorrhages are rarely dangerous, and the tendency to them can often be corrected by the use of simple laxatives and regular attention to the movements of the bowels.

In Internal Hemorrhage of women, ice-cold cloths may be placed upon the abdomen. One of the most efficient modes of checking such hemorrhages is to use large injections of water, as hot as can be borne, *directed to the source of the bleeding*. Rest in bed, without a pillow, and *with the head lower than the body*, must also be secured. The foot of the bed may be raised to favor a correct position of the body. Ten grains of quinine, mixed with water, will often promptly check such a hemorrhage, and should be given in every case.

Transportation of Injured Persons.

If injured persons have to be removed from one place to another, it is worth while to know how to do it with the greatest ease and safety to them. If a door or shutter or settee is at hand, any of these will make a good litter, with a blanket or shawls or coats for pillows. In placing a person upon a stretcher, it should not be laid alongside of him, but with its foot at his head, so that both are in the same straight line. Then one or two persons should stand on each side of him, and, raising him from the ground, slip him up on the stretcher. This can be done smoothly and gently ; whereas, if a stretcher be laid alongside the injured person, some of those who lift him will have to step backward over it, and in doing so may stumble. One person should, if possible, give his whole attention to supporting the injured part, when a person is put upon a stretcher. A stretcher should not be carried on the shoulders, but should be held with the hands or supported by straps passing over the shoulders of the bearers. The

bearers should also march in broken step, and not "keep time." In going up hill, the patient's head should be in advance ; in going down hill, his feet.

If a limb is crushed or broken, it may be laid upon a pillow, with bandages tied round the whole, so as to keep it from slipping about (see p. 71). Where



FIG. 27.—Position of hands called "Lady of London."

an injured person can walk, he can get much help by putting his arms over the shoulders and round the necks of two others. In case of an injury, when walking is impossible, and lying down is not absolutely necessary, an injured person may be seated on a chair and carried, or he may sit upon a board or a

fence-rail, the ends of which are carried by two men, around whose necks he should place his arms, so as to steady himself; or two men may carry him seated on their interlocked hands, in the way known to

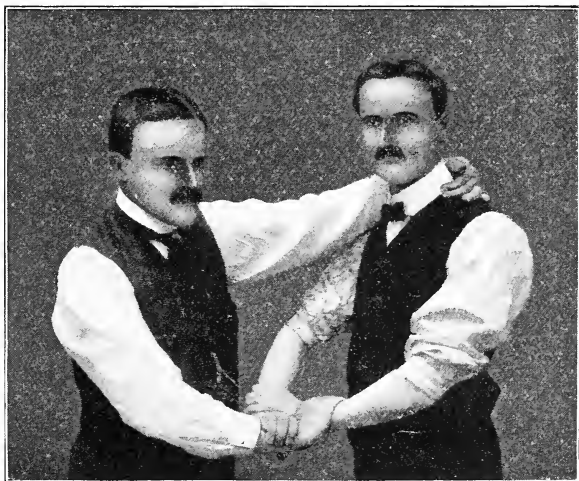


FIG. 28.—Three-handed Chair, with Back.

children as “Lady to London.” For this purpose each of two persons, standing face to face, should grasp his left wrist with his right hand (the backs uppermost), then he should grasp his companion’s

free right wrist with his own free left hand, as shown in Fig. 27.

A very useful method is the three-handed chair made by one man grasping his own wrist and with the hand of the latter grasping the wrist of an assistant, who, with the hand of the same arm, grasps

the yet free wrist of the first man, and with his other hand clasps the neck of the first. This makes a chair with a back, and may be used where an injured person cannot help himself with his arms. (See Fig. 28.) When no litter can be obtained, the body may be supported by two men, one on each side, with their arms placed behind his chest and under his



FIG. 29.

hips, as in Fig. 29. Another mode of carrying an injured person is that shown in Fig. 30. One man passes his arms from behind under the armpits and clasps his hands over the chest of the injured person, and raises him from the ground, while another carries one leg over each of his own arms.

In carrying an injured person upon a litter, or what serves as one, the bearers, as stated above,



FIG. 30.

ought not to keep step ; but when they are not using a litter, they should keep step. (Figure 30 is incorrectly drawn in this respect.)

Poisons.*

Immediately upon the discovery or suspicion of poisoning, some one should be dispatched for a doctor, if possible carrying information as to the poison taken, so that valuable time may be saved. Meanwhile the following directions should be carried out.

Unknown Poisons.—First of all a large quantity of water should be given, lukewarm, if possible ; then, if vomiting has set in, this should be encouraged ; if not, it must be provoked. The simplest way to do this is to give large draughts of lukewarm water, and to tickle the throat. A teaspoonful or two of ground mustard, or a teaspoonful of powdered ipecac, or a tablespoonful of the syrup of ipecac

* For the assurance of those who have to manage cases of accidental poisoning, it may be said that, if promptly treated, they are very rarely fatal. In an experience of nearly thirty years the author has never seen a case of death from poison taken by mistake. This does not cover such a case as recently occurred in a large city, when a druggist sent a man, who came to his shop and said he had swallowed a preparation of fish-berries (*cocculus Indicus*), to his home, with the advice to drink mustard water, instead of immediately giving him an emetic!

may be stirred up in the water. Further, let it be remembered that there is no occasion for fastidiousness. Any water will do. Water in which hands—or dishes, for that matter—have been washed may, by its very repulsiveness, act more quickly than anything else; and if soap has been used, it will be all the better for that, as soap is an antidote for many poisons. The quantity used must be large; the sufferer must be urged to drink and drink, a large quantity at a time, and be made to vomit several times—not pushing this to exhaustion, however.

After copious vomiting, soothing liquids should be given, such as oil, milk, beaten-up raw eggs, or flour and water—all in moderately large quantities. These are especially valuable when the poison has been of an irritating character.

If the sufferer be much depressed in body or mind,* the hands and feet cold, the lips blue, the face pale, a cold perspiration upon the forehead and about the mouth, then some stimulant may be administered. Strong, moderately hot tea, without milk, is the best, because it is a chemical antidote to many poisons. Strong coffee is next in value. Stimulation may also be secured by giving brandy, whiskey, wine or alcohol, in teaspoonful doses,

* Depression occurs in almost all cases of accidental poisoning, largely because of the natural alarm that is present.

mixed with a little hot water, for an adult, and half as much for a child. Warm coverings are not to be forgotten ; and if the depression be great, hot water-cans or hot bricks, wrapped in one or two thicknesses of blanket so as not to blister, should be laid by the side of the chest, or a huge corn-meal poultice may be placed round the body, or a blanket, wrung out of hot water and covered with a dry one. (See "Shock," p. 98.)

Oil of Vitriol (*sulphuric acid*) and **Nitric** and **Muriatic Acids** are heavy, sometimes yellowish-looking, fluids ; the first, as its name implies, not unlike oil in appearance, but very heavy in a bottle. The others are lighter, and give off extremely pungent, irritating fumes. All discolor almost anything on which they fall ; the first blackens white pine wood ; the others turn it yellow. All burn severely, and leave no doubt of their caustic nature.

For these the proper treatment is to give an alkali. A tablespoonful of hartshorn mixed with two teacupfuls of water may be given, or large quantities of lime-water, or baking or washing soda, magnesia, potash, whitewash, chalk, tooth-powder, whiting, plaster from the wall, soap, or even wood ashes, stirred up in water.

In poisoning with these "mineral" acids, vomiting should not be provoked, because there is no need

to bring back the acid if it has been fully neutralized, and there is no use in doing so if it has not been. After using the alkaline antidote, the bland fluids mentioned above may be administered, and rest should be secured, and stimulation employed if necessary. The local burns have to be treated afterwards as described at page 47.

Oxalic Acid comes in small, heavy, bright, colorless crystals, with an intensely sour taste, making a clear, rattling sound when shaken in a bottle or jar. For this the best antidote is slaked lime in some form. If lime-water* is at hand, it may be given freely, or whitewash, tooth-powder, chalk, whiting, or plaster from a wall. The latter may be crushed and stirred up in water, without regard to the grittiness, which will not do any harm.

Prussic Acid (*hydrocyanic acid*) is a very dangerous poison, and usually immediately fatal. The cyanide of potash (used by photographers) and oil of bitter almonds are poisonous because of the prussic acid they contain. Poisoning with either of these must be treated with an emetic, followed by magnesia, lime-water, soda, or soap, and afterward bland liquids and stimulants. Hartshorn may be

* Lime-water may be made in an emergency by putting a piece of lime about as large as a walnut in a pint of water and shaking them well together for a few minutes.

inhaled from a handkerchief. Fresh air must be secured, and artificial respiration may be needed.

Carbolic Acid and **Creasote** are usually in solution, as a thick, clear, pink, or dusky fluid. When taken by the mouth they cause whitening and shriveling of the mucous membrane lining it, with intense burning, and then numbness. There is also nausea, weakness, depression, and sometimes actual collapse. These are very dangerous poisons, because they act as caustics, and also benumb the stomach so that it is hard to provoke vomiting. The best antidote is Epsom salts (sulphate of magnesia) of which a tablespoonful should be given dissolved in water. Alcohol is one of the best antidotes for carbolic acid, and should be freely given, as alcohol or in the form of whiskey or brandy. Next in value to this is baking soda, in tablespoonful doses. After one of these antidotes large draughts of oil, white of egg, magnesia and water, or milk should be given. Rest, warmth of the body, and stimulation must also be secured if there is depression.

Alkaline Poisons.—The strong alkalies are *ammonia*, or *hartshorn*—which is a clear fluid with an unmistakable odor—caustic *potash* and *soda*, usually dissolved, and sometimes in the form of lye. Liniments containing these substances are sometimes swallowed by mistake.

Strong alkalies, which usually burn intensely, must be combated with an acid. Vinegar can generally be had ; and there is nothing better. It should be given undiluted, and freely—a half teacupful at a time. Lemon juice may be used, or even orange juice ; though the latter is too mild an acid to be of much service, unless the oranges are very sour. Vomiting may do harm, and this part of the treatment may well be left to nature. After the antidote, milk, oil, or eggs should be given, and rest should be secured.

Arsenic (Arsenous Acid) is a white, sweetish powder, often used in fly-papers and powders to destroy domestic pests, such as rats, bugs, and roaches. It is also found in some paints, and in wall-paper or glazed toy papers. It usually excites vomiting and violent pain in the stomach. The most convenient antidotes are large quantities of milk, white of egg, flour and water, oil or lime-water. The best (the chemical) antidote may be prepared by mixing two fluid ounces of solution of ferric sulphate (*liquor ferri ter-sulphatis*) and four fluid ounces of water, and (in a separate vessel) three drachms (180 grains) of magnesia (calcined magnesia) with half a pint of water, and then pouring one mixture into the other and shaking them thoroughly together. Instead of the magnesia mixture, two ounces of hartshorn (water of ammonia)

diluted with a pint of plain water may be added to the iron solution.

An emetic should be given before and after using any antidote, and then bland liquids, with moderate stimulants; followed by a dose of castor oil.

Paris Green and **Fowler's Solution** are arsenical preparations. If taken as a poison, the treatment is the same as for poisoning with simple arsenic.

Sugar of Lead (*acetate of lead*) comes in white lumps or a powder. Poisoning with lead is to be treated by provoking vomiting, and giving Epsom salts or Glauber's salts (sulphate of soda), milk, eggs, and castor oil.

Corrosive Sublimate (*bichloride of mercury*) comes in small, colorless crystals, or in a clear solution; it is also contained in most of the "antiseptic tablets" used in making washes and dressings for surgical cases. For corrosive sublimate poisoning, vomiting should be provoked, and some form of tannic acid should be given. Strong tea is the handiest thing containing this, and its administration should always be followed by giving raw eggs, milk, lime-water, or flour and water.

Tartar Emetic (*tartrate of antimony and potash*) is a white powder, the effects of which are best combated in the way recommended for corrosive sublimate poisoning.

Phosphorus is found in the heads of matches, and it is contained in some rat-poisons. It is a poison that acts slowly, and affords ample time for securing medical advice. A good antidote is sulphate of zinc, in ten-grain doses, dissolved in water, and given at intervals of ten minutes until vomiting comes on. Half-teaspoonful doses of old turpentine are said to be very useful in poisoning with phosphorus. Then a dose of magnesia should be administered ; but *no oil of any kind*.

Croton Oil is sometimes contained in liniments. It produces great pain in the stomach, with griping and purging, and depression. If recently taken, it should be treated with an emetic, and bland liquids, like milk, oil, or white of egg, and the administration of stimulants, and full doses of laudanum or paregoric. No purgative should be given.

Lunar Caustic (*nitrate of silver*) is sometimes swallowed. The antidote for this is a strong brine of salt and water, given again and again ; and vomiting should be provoked until the vomited matters cease to have a look like thin milk. Afterward, a dose of castor oil may be given, and bland liquids.

Iodine, in the form of a tincture, is also sometimes swallowed by mistake. The antidote for this is starch and water, or plenty of milk, or flour and water.

Severe burning is sometimes caused by painting the skin with tincture of iodine. The best treatment for this consists in the application of cloths well soaked in thin boiled starch (clear starch), and kept from becoming dry by frequent renewals, or by covering with oiled silk or paraffine paper. As long as the starch turns blue when put on the burn, active iodine is still in the skin, and the applications should be continued.

Formaldehyde, so much used as a disinfectant, is dangerous if taken into the stomach in any considerable quantity. The best antidote is ammonia water or aromatic spirits of ammonia, in teaspoonful doses, the former in a teacupful of plain water, and the latter diluted with half this quantity.

Opium Preparations are *opium*, *morphine*, *laudanum*, *paregoric*, *black-drop*, *chlorodyne*, some liniments, and many nostrums sold as soothing-syrups, pain-destroyers, and drops for infants. Opium produces deep sleep, with narrowing of the pupil of the eye to a small circle, which does not enlarge in the dark. Here emetics must be used promptly and persistently, and vomiting must be produced over and over again. Strong black coffee must be freely given as a stimulant. So long as the breathing does not fall below ten to the minute, there is no *immediate* danger of death; but opium is a treacherous

poison, and requires all the skill that can be obtained to combat it. The important matter is to keep up the breathing. The custom of walking the patient up and down, and slapping him with wet towels, is to be deprecated, because it adds exhaustion to stupor. If an electrical battery can be obtained and used, it is the best thing that can be done. The Faradic current should be applied to stimulate the sensory nerves in the skin, so that they shall excite reflex acts of deep breathing. The next best thing is to lay the patient upon a lounge, and to slap his skin from time to time with the back of a broad brush or with a slipper. This is all the rousing that is necessary as long as the breathing keeps above ten to the minute. Should it fall below this, or if the breathing should cease, artificial respiration should be employed. (See p. 13.)

Chloral is a damp, colorless, crystalline substance, usually seen in solution. The symptoms and treatment of poisoning with chloral are similar to those of opium poisoning.

Belladonna, and its active principle, **Atropia**, are so much used in medicine that accidents sometimes occur from their misuse. Symptoms of poisoning with belladonna are a dilated pupil, a peculiar flush of the face, dry throat, unsteadiness of gait, and delirium. The treatment consists in giving an

emetic, followed by rest, warmth to the extremities, and a moderate quantity of strong black coffee, or of hartshorn (a teaspoonful in a teacupful of water), wine, whiskey, or brandy.

Nux Vomica, and its active principle, **Strychnine**, are intensely bitter substances, which in poisonous doses produce spasmodic contraction and stiffness of the muscles of the jaws, limbs, and body. This condition should be treated by provoking vomiting and giving a purge, and doses of thirty grains of bromide of potash, or twenty grains of chloral, or both, to an adult, and one-quarter as much to a child for each five years of its age. Then the greatest quiet should be secured. The poisoned person should be put to bed in a darkened room, with doors, windows, and shutters arranged in a way that shall exclude all sights, sounds, and draughts, though permitting as good ventilation as possible.

Aconite, and **Veratrum Viride**, in the form of the tincture and contained in liniments, are sometimes swallowed by mistake. Aconite causes a peculiar numbness in the lips and tongue, and later numbness and tingling in the arms or legs, which is an evidence that the poison has entered the blood. Veratrum viride causes weakness of the heart and faintness. The treatment for poisoning with either is the same as that for belladonna poisoning.

Digitalis, taken in an overdose, may produce vomiting and a slow pulse with labored breathing. This condition should be treated with an emetic, plenty of milk, and moderate stimulation.

Hemlock, Deadly Nightshade, Jamestown (or Jimson) Weed, Monkshood and Toadstools or **Poisonous Mushrooms** are sometimes eaten without knowledge of their dangerous character. **Tobacco, Indian Tobacco, Poison Sumac**, the berries of **Poison Ivy**, and other plants sometimes cause poisonous effects. Nightshade, Jamestown weed, and monkshood produce widening of the pupil and some delirium—usually of a laughing sort, and often a disposition to pick at imaginary objects, but no sleepiness. The treatment is the same as that for belladonna poisoning.

Alcoholic Liquors are sometimes taken in such large quantities as to be poisonous. When this is the case there are evidences of deep stupor or depression. The course to be pursued is to cause vomiting, to give hartshorn and water (a teaspoonful in a teacupful), or aromatic spirits of ammonia in doses twice as large, and to keep the body warm. (See "Intoxication," p. 42.)*

*A number of so-called tonics and predigested foods contain a larger percentage of alcohol than does whiskey, and may produce all the bad effects of alcoholic drinks.

Chloroform taken internally may cause alarming symptoms; and in such cases the treatment is that for alcohol poisoning. It should be remembered that about a third of chloroform liniment is pure chloroform.

Decayed Meats or Vegetables usually excite vomiting, which should be encouraged until the stomach is empty, and followed by a dose of castor oil and a teaspoonful of powdered charcoal.

Recapitulation.—We have now completed the list of poisons that are at all common, and have seen what should be done in almost any case that is likely to occur. In conclusion, let it be remembered that, when there is an alarm of poisoning, some *one*, at least, *must keep cool*; then, that a physician is to be summoned (sending him word, if possible, what poison has been taken); and that, until his arrival, the course indicated above should be followed. Another thing which may be remembered is, that accidental poisoning is very rarely fatal. So, in case of poisoning, the treatment here suggested may be followed, and it may generally be expected that the patient will get well. To save time in an emergency, the following table may be consulted, which gives the name of each poison we have already studied and the proper treatment for it:

POISON.	TREATMENT.
<i>Unknown</i>	{ Emetic, Bland liquids, Stimulation.
<i>Acids—</i> Sulphuric, } Nitric, } Muriatic. }	{ An alkali, Bland liquids, Rest, Stimulation.
<i>Oxalic Acid</i>	{ Emetic, Chalk, Bland liquids.
<i>Prussic Acid—</i> Oil of Almonds, } Cyanide of Potash. }	{ Emetic, Bland liquids, Stimulation.
<i>Carbolic Acid,</i> } <i>Creasote.</i> }	{ Emetic, Epsom salts, baking soda, or Bland liquids, [alcohol, Rest, Stimulation.
<i>Alkalies—</i> Hartshorn, } Soda, } Potash, } Lye. }	{ An acid (vinegar), Bland liquids, Rest, Stimulation.
<i>Arsenic—</i> Paris green, } Scheele's green, } Fowler's solution. }	{ Emetic, Iron sulphate and magnesia or hartshorn, Castor-oil, Rest, Stimulation.
<i>Sugar of Lead</i>	{ Emetic, Epsom salts, Bland liquids, Castor-oil.
<i>Corrosive Sublimate,</i> } <i>Tartar Emetic.</i> }	{ Emetic, Strong tea, Raw eggs and milk, Castor-oil, Stimulation.
<i>Phosphorus</i>	{ Emetic, Sulphate of copper, Turpentine, Magnesia, but no oil.
<i>Croton Oil</i>	{ Emetic, Bland liquids, Laudanum or paregoric.
<i>Lunar Caustic</i> (nitrate of silver). }	{ Salt and water, Castor-oil, Bland liquids, Emetic.

POISON.		TREATMENT.
<i>Iodine</i>	{	Emetic, Starch and water, Bland liquids.
<i>Formaldehyde</i>		Dilute hartshorn.
<i>Opium</i> — Morphine, Laudanum, Paregoric, etc. <i>Chloral.</i>	}	{ Emetic, Strong coffee, Keep up breathing.
<i>Belladonna</i> — (atropia).	}	{ Emetic, Warmth, Coffee.
<i>Nux Vomica</i> } <i>Strychnine</i> }	{ Emetic, Purgative, Absolute quiet.
<i>Aconite,</i> <i>Veratrum Viride.</i>	}	{ Emetic, Stimulation, Head low.
<i>Digitalis,</i> <i>Hemlock,</i> <i>Nightshade,</i> <i>Jamestown Weed,</i> <i>Monkshood,</i> <i>Toadstools,</i> <i>Mushrooms,</i> <i>Tobacco, etc.,</i> <i>Poison Sumac,</i> <i>Poison Ivy.</i>	}	{ Emetic, Stimulation.
<i>Alcohol,</i> <i>Chloroform.</i>	}	{ Emetic, Hartshorn and water.
<i>Decayed Meat or Vegetables</i> . .		{ Emetic, Purgative, Powdered Charcoal.

Emetics (to Provoke Vomiting) are warm water with or without ground mustard (a tablespoonful to a pint of water), or ipecac (a teaspoonful of the powder or a tablespoonful or so of the syrup), and tickling the throat with a feather or a finger. The best drug emetic is sulphate of zinc in ten-grain doses for an adult, and for a child a grain for each

year of its life. Large quantities of warm water should be given whenever vomiting is to be excited.

Bland liquids are milk, raw eggs, some sort of oil, gruel, flour and water, etc.

Stimulants are tea, coffee, whiskey, wine, hartshorn or aromatic spirits of ammonia. Of hartshorn, a half-teaspoonful in a teacupful of water will be enough for a dose. Of aromatic spirits of ammonia a teaspoonful may be given in a half teacupful of water. In making tea or coffee, one must not wait to do it as if for the table, but mix hot water and the leaves, or grounds, squeeze them well, stir together, and give the whole—leaves, grounds, everything. At the same time, some may be made regularly, if there are conveniences for it.

Alkaline antidotes (for acid poisons) are hartshorn and water (a tablespoonful in two teacupfuls of water), soap and water, lime, whiting, soda, chalk, tooth-powder, plaster, magnesia, whitewash, and even wood ashes.

Acid antidotes (for alkaline poisons) are vinegar and lemon juice.

In giving an antidote, one must never wait for it to dissolve, but just stir it up in any fluid at hand except oil, and have it swallowed immediately.

When laudanum is advised after poisoning with any violent irritant like Croton oil, or for severe

pain, it should be given in doses of half a teaspoonful to an adult and a drop for each year of a child's age. Such a dose may be repeated in half an hour, if the pain continues to be severe and there is no drowsiness.

It is well to bear in mind that it is much better and easier to prevent accidents than to correct them. Therefore, dangerous articles should be kept invariably out of reach of children, and any bottle containing what may be dangerous should be marked with a ball and chain, such as the druggists sell, or by tying a stout piece of tape round its neck. This gives warning in the dark as well as in the light. Medicine bottles containing drugs dangerous to children should be labeled "Poison" by the apothecary.

Description of Poisonous Plants.

Poisoning is sometimes caused—especially among children—by eating parts of certain plants which grow wild in the woods or fields, or by the roadside.

A few of these may be described, so that they may be avoided if possible, or—in case of accident—that it may be known what has done the mischief.*

Bitter-sweet, Woody Nightshade (*Solanum dulcamara*) must not be confounded with the cultivated plant called “bittersweet.” The woody nightshade is a shrubby, climbing plant, bearing blue or purple flowers, with an orange-colored center, and oval, bright red berries, that are poisonous.

Deadly Nightshade (*Atropa belladonna*) grows three or four feet high, has large, dark-green, pointed leaves growing on downy stems, with drooping, bell-shaped flowers and blue-black berries (when ripe), marked with a deep furrow. (Fig. 31.)

* The treatment of poisoning by any vegetable mentioned here, but not the preceding chapter, is the same as that for belladonna. (See page 137.)

Fool's Parsley (*Æthusa cynapium*) grows about two feet high, in waste ground, and looks something like ordinary parsley (*Apium petroselinum*), but has a disagreeable odor. Its leaves are compound and dark green, and its flowers are white.



FIG. 31.—Nightshade—*Atropa belladonna*.

Foxglove (*Digitalis*) is a European and Asiatic plant, cultivated in gardens in various parts of the world. It grows three or four feet high. It has large,

dull-green, downy leaves, and handsome, bell-shaped crimson or purple flowers, with beautiful spots within, and arranged in a “spike.” (Fig. 32.)

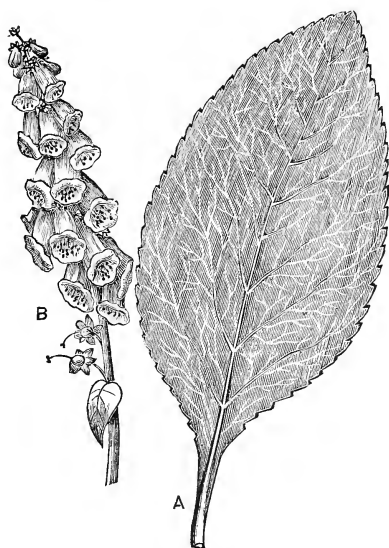


FIG. 32.—Foxglove—*Digitalis*.

Hemlock.—Ground Hemlock, Dwarf Yew (*Taxus canadensis*), looks like a dwarf spruce tree. It is an evergreen, with small red and juicy berries

(drupes) concave on the summit. The leaves and black seeds are poisonous.

Hemlock.—Poison Hemlock (*Conium maculatum*) grows from three to six feet high, with many branches, the stems of which are smooth, round, and spotted with purple. The leaves are compound, and bright green. It has small, white flowers, arranged in umbrella shape. The plant has a disagreeable odor.

Hemlock. — Water Hemlock, or Spotted Cow-bane (*Cicuta maculata*), is a plant growing from three to six feet high, in damp ground, with slender, compound, notched leaves, on a hollow stem, and small, white flowers, arranged in shape like an umbrella. The root is thick and fleshy, and very poisonous. The leaves are poisonous, and often prove injurious to cattle. (Fig. 33.)

Henbane (*Hyoscyamus*) is a plant which grows about two feet high, with large, pale green leaves with scalloped edges. The flowers are straw-colored, rimmed with a purple, urn-shaped cup. (Fig. 34.)

Indian Poke, Green Hellebore (*Veratrum viride*, *V. album*), grows from three to six feet high, with large, coarse, oval, pointed leaves, with straight veins, with many small, yellowish green flowers, arranged at the top of the stem on little branches (panicle). Its root is exceedingly poisonous and dangerous. (Fig. 35.)

Indian Tobacco (*Lobelia inflata*) grows about two feet high, with a rough, straight stem, pointed, notched, and hairy leaves, with small, pale blue

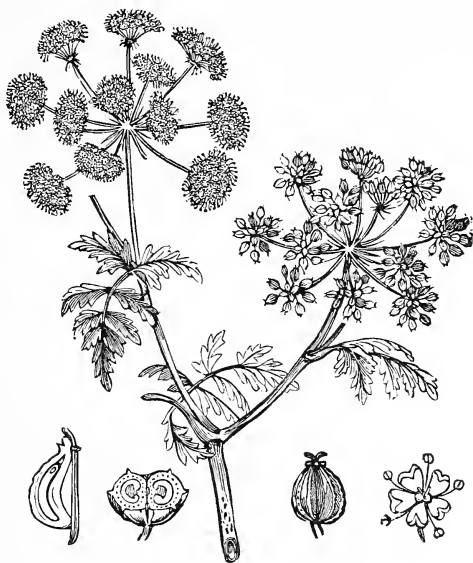


FIG. 33.—Water Hemlock—*Cicuta maculata*.

flowers springing from the junction of a leaf-root with its stem.

Indian Turnip, or Jack-in-the-Pulpit (*Arum*), grows about a foot high, with a peculiar flower on a

straight stem, with scarlet berries. The root is turnip-shaped and has a burning taste.



FIG. 34.—Henbane—*Hyoscyamus*.

Jamestown or “Jimson” weed, Thorn-apple
(*Stramonium*), grows about three or four feet high,

with tough skin, ragged leaves, and a white or tinted flower like a very tall, slender vase. A peculiar fea-



FIG. 35.—Indian-poke.

ture of the Jamestown weed is the seed-pod, which is green when young and gray-brown when mature and dry. It is very rough and thorny outside, and

contains seeds that are soft and white when young, and become hard and black when old. (Fig. 36.)

Monkshood (*Aconitum napellus*) is a native of the mountainous parts of Europe and Asia. It grows



FIG. 36.—Jamestown Weed—Stramonium.

about four feet high, with leaves deeply cleft into five parts. Its flowers are dark blue, with a vaulted upper sepal, like a monk's cowl. They are arranged of

in the form called a spike—several flowers along a common stem.

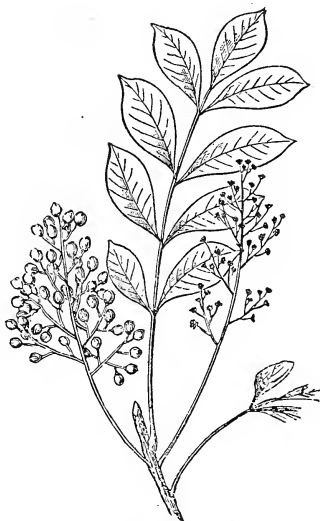


FIG. 37.—Poison Sumac—*Rhus vernix*.

Poison Ivy, Poison Oak, Poison Elder, Poison Sumac,* are names given to two varieties of the sumac

*The common Upland Sumac (*Rhus glabra*), with greenish flowers and purplish, hairy berries, and with beautiful scarlet leaves in autumn is not at all poisonous. The Virginia Creeper (*Ampelopsis quinquefolia*) with leaves arranged in clusters of five, and scarlet leaves and purple berries in autumn, is not poisonous.

family—one (*Rhus vernix*) a shrub or small tree having oval, pointed leaves, arranged in clusters of from seven to thirteen upon a common leaf-stalk (Fig. 37) ; and the other (*Rhus radicans*) a creeping or

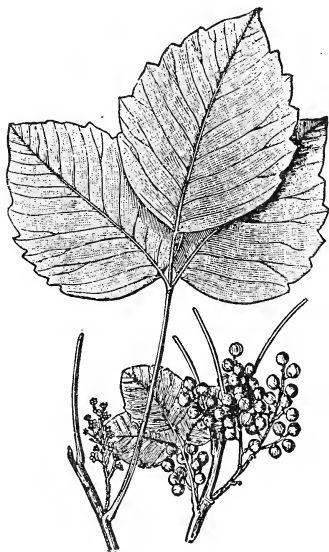


FIG. 38.—Poison Ivy—*Rhus radicans*.

climbing plant having broader leaves, arranged in clusters of three, and at times slightly notched. (Fig. 38.) Both bear small, round berries somewhat like

those of the elder, or the Virginia Creeper, but gray or white, while the latter have dark blue or purple berries, and the leaves of the Virginia Creeper are in clusters of five. The berries of the rhus are poisonous; and the whole plant has the power, when touched or even when approached, of exciting in some persons a very troublesome affection of the skin.

Poke-berry (*Phytolacca decandra*) is a very common shrub in North America, growing from four to eight feet high, with a smooth stem, often of a deep purple color, with greenish-white flowers, and clusters of dark purple berries at the end of delicate stems. The plant is not very poisonous, but may cause dimness of vision and even convulsions.

Wild Parsnip (*Pastinaca sativa*) is a plant about three feet high, with compound leaves made of small leaflets arranged along a grooved stem; they are dark green, and downy on the under side. The flowers are yellow, and they grow in small clusters. The root is tapering, like that of the cultivated parsnip. The root of the wild parsnip, unlike that of the food parsnip, has a harsh and bitter taste.

Wolf's-bane (*Aconitum Uncinatum*) is a plant about two feet high, with dark green leaves deeply cleft, and with three or four large purple flowers at the end of each branch.

Mushrooms.—Poisoning with mushrooms is usually

due to failure to distinguish between those that are harmless and those that are injurious, from an undue



FIG. 39.—Poisonous mushrooms, showing "death-cup" at base of stem.
reliance upon certain old-fashioned rules which are not

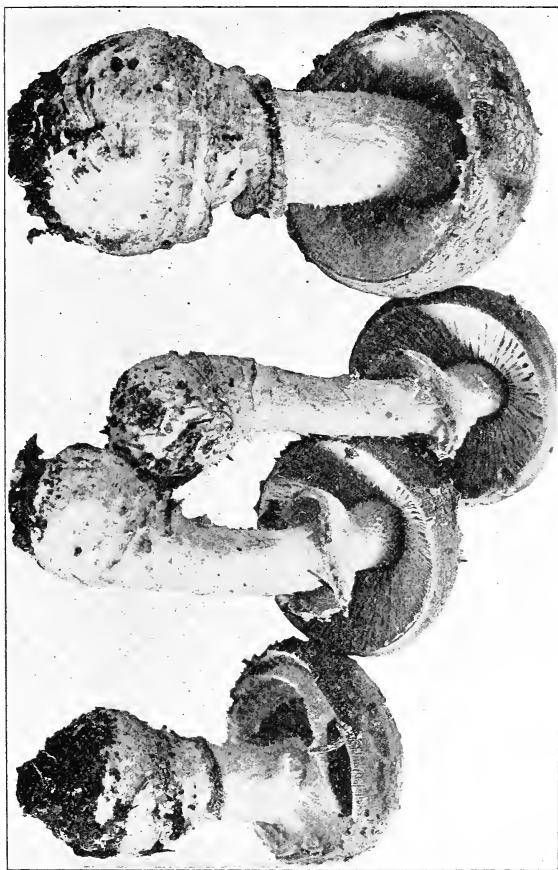


FIG. 49.—Poisonous mushrooms showing "death-cup" at base of stem.

trustworthy. The safest line of conduct is to consider dangerous all mushrooms that are decaying or infected; all that are in the immature button-stage; and all that have the following characteristics:

1. A cuplike formation at the base of the stem.
(Fig. 39.)

2. A scaly or closefitting layer at the base of the stem.

3. Loose warts on the cap.

4. A milky juice (unless this is red).

5. Great brittleness, with gills nearly all of equal length, and the flesh of the cap thin.

6. A honey-combed appearance of the gills, if the flesh tastes bitter, or the mouth of the tubes are reddish, or the flesh changes color when cut or bruised.

7. A cobwebby veil or ring when the plant is young.

8. A slimy cap and clay-colored spores.

The illustrations* (Fig. 39 and Fig. 40) show the ring at the base of the stem which is commonly known as the "death-cup," because many mushrooms with this peculiarity are very poisonous. For this reason it is prudent never to eat such mushrooms, although experts know that some mushrooms with "death-cups" are not unwholesome.

* Figures 39 and 40 are copies of the original photographs, kindly loaned by George Francis Atkinson, Professor of Botany in Cornell University—after being used in illustrating his valuable book on "Mushrooms—Edible and Poisonous." The description of danger signs is derived from the same work.

Domestic Emergencies.

No less important than the emergencies thus far considered, most of which have a sort of public significance, are some that occur at the dead of night, in traveling, at the seashore, or in the mountains, where physicians are not known or are not to be had promptly; and those upon whom the burden of meeting them falls may be glad to have some simple suggestions as to what they may do until they can commit their interests to one better prepared to guard them.

Cholera Morbus produces vomiting and purging and violent cramps in the stomach. The pain may be so severe as to seemingly threaten life, though a fatal ending of such attacks is almost unknown. In the attack there is a pinched expression of the face, and a cool, clammy skin. In such cases, something must be done at once to relieve the pain. For this, laudanum may be given—half a teaspoonful to an adult, and to a child a drop for each year of its age. At the same time heat must be applied to the stomach.

For this purpose a mustard plaster may be used, or cloths wrung out of hot water and sprinkled with turpentine (a turpentine stupe) or with red pepper, or a hot-water bag or bottle, or a plate heated at the fire and covered with a cloth.* An injection (enema) composed of a small teacupful of warm water or milk, to which a tablespoonful of tincture of asafœtida has been added, often gives great relief.

Colic consists in violent griping pains in the abdomen. It is usually due to cold, or to something indigestible that has been eaten. It should be treated with hot applications to the abdomen, such as have just been mentioned. A purgative, such as castor-oil, or castor-oil and spiced syrup of rhubarb, may be given by the mouth, and an injection of water and asafœtida may be administered as described in speaking of cholera morbus. Rubbing the belly, sipping hot water, with or without spirits of peppermint, or dissolved "soda-mint" tablets, often does good. In infants signs of colic may be caused by simple hunger, and may be cured by a feeding.

Vomiting, or Nausea, due to something objectionable in the stomach, should be treated by giving large draughts of quite hot water. If it be due to nervousness or a slight indigestion, it can usually be

* Hot applications must never be hot enough or left on long enough to make a blister.

corrected by swallowing small pieces of ice, or tablespoonful doses of lime-water, or a pinch of soda, or half a teaspoonful of aromatic spirits of ammonia, in a wineglassful of cold water, or half a dozen of the soda-mint tablets sold by all druggists. The application to the pit of the stomach of a mustard plaster, or of a flannel cloth wrung out of hot water and sprinkled with a tablespoonful of turpentine or some red pepper, is also useful. Cold applied to the pit of the stomach sometimes does much good. The sufferer should, if possible, lie down until the nausea passes off. When the stomach will not hold small quantities of water, large draughts should be given, and will generally be retained. If they are vomited, the vomiting is easier than retching, and the stomach is washed out in the process—a very desirable thing.

Diarrhœa is usually due to a cold or to something indigestible that has been eaten, or to both, and is an effort of nature to cure itself of something hurtful. So, at the start, the best thing to be done is to give a mild purge. It is a good plan to give to an infant a teaspoonful of a mixture of equal parts of castor-oil and glycerine, or of the oil and spiced syrup of rhubarb, and a tablespoonful or two to an adult. Nothing acts better for adults or infants than a tenth of a grain of calomel, given every half hour until it produces a free movement. After this,

if the movements of the bowels are too frequent, half a teaspoonful of essence of ginger in a wineglassful of water may be given to an adult after each passage. If this does not check the movements, ten drops of laudanum or a teaspoonful of paregoric may be given to an adult after each passage. For an adult, also, an injection, made of half a teacupful of thin boiled starch, to which thirty or forty drops of laudanum have been added, often gives immediate relief. A child over two years old may be given a like injection containing a tablespoonful or two of starch and a drop of laudanum for each year of its age; or, half a teaspoonful of paregoric may be given after each passage, until the diarrhoea seems checked or there is some evidence of drowsiness. A simple remedy, that often acts well, is a tablespoonful of raw flour stirred up in a glassful of cool water, to be taken in two doses, half an hour apart.

Dysentery sometimes follows a simple diarrhoea, and sometimes comes on suddenly, with fever, and often, in children, with screaming. There is a strong and constant inclination to have the bowels moved, but the passages are usually small, and the movements accompanied with severe straining and pain and the discharge of some blood.

The treatment is best begun with a purge of castor-oil and rhubarb. Then laudanum may be given by

the mouth (half a teaspoonful to an adult, and to a child a drop for each year of its age). Great relief is sometimes afforded by large injections of cool water very slowly and gently given, the patient lying down, with the hips elevated and the shoulders lowered; or small injections of thin boiled starch (six tablespoonfuls for an adult and one for an infant), with laudanum in the same dose as would be given by the mouth. Rest in bed and liquid food are indispensable parts of the treatment.

The discharges from the bowels should be disinfected by adding to them *boiling* water or chloride of lime. The vessels used should also be scalded after every emptying.

Constipation in infants or little children may present very trying features. It is usually due to an excess of casein in the food, and may be corrected by modifying the food as suggested on page 176. The child, when old enough to take them, should be given gruels and broths, and always plenty of water. A child with teeth should be given crusts of wheat or bran bread to chew, and perhaps syrups and stewed dried fruits. No purgatives should be given; but as a laxative, the syrup of senna, in teaspoonful doses, is better than any of the proprietary medicines so largely used. At times a "gluten suppository" will do good, or even, on rare occasions an injection of warm water and a little soap.

Croup.—Attacks of spasmodic croup, though very alarming, are rarely dangerous. There is probably much less real croup than is supposed, and the hoarse cough which children often have after taking cold may lead to measures which make it much worse for all concerned. Parents need not get excited when they hear what is called a “croupy” cough. When it occurs, they should first see what can be accomplished by allaying the alarm of the child and by diverting its mind. Turning on a full light, the reading of an interesting story, or the exhibition of a favorite toy may cause all the symptoms of croup to disappear.

When such mild measures are of no avail, and the symptoms become more urgent, the little sufferer should be given an emetic of a teaspoonful of syrup of ipecac or a half teaspoonful of powdered alum, followed by a draught of warm water. After the attempt at provoking vomiting, it is well to give a purge like castor-oil and spiced syrup of rhubarb. Cloths wrung out of water as hot as can be borne should be wrapped around the throat and laid upon the chest. They should then be covered with something to keep the heat in—like oiled silk or a dry cloth.

This is all that can ordinarily be done with advantage until a physician arrives. But it usually gives

decided relief. In this case, and even if it does not, natural anxiety should not drive parents to be wanting to do something else all the time. They may renew the hot cloths as soon as they begin to grow cool ; but besides this there is nothing to be done but to wait until there has been time for the spasm to pass off. This is hard to do, it is true ; but it is the best thing to be done, and far better than the fuss and worry of trying a variety of methods.

Whooping-Cough.—Children with whooping-cough should go out in fine weather ; in bad weather they should be kept in a well-ventilated room in a warm and (if possible) moist atmosphere. Moisture can be secured by having a flat vessel containing water upon the stove, or by putting a basin of water on a chair in front of a register and hanging a long towel over the back of the chair with one end in the water. The towel may be dipped in the water from time to time as it becomes dry. In whooping-cough, the bowels should be kept open ; and only good, digestible food should be given. A belladonna plaster on the chest sometimes does good ; and if the paroxysms of coughing are very severe, some form of opium may be given. Thirty drops of paregoric may be given to a child two years old, and repeated in an hour. A child six years old should have half a teaspoonful at a dose.

In whooping-cough there is a strong nervous element, and a spasm of coughing is often brought on by the example of another child. So, when a child is seized with a fit of coughing, it ought, if possible, to be at once separated from other children, for its own good and for theirs. There is nothing of much value in the way of medicine. Fresh air, good food, protection from exposure, and time are the best means to recovery.

Asthmatic Attacks, including those of hay fever, may be treated in several ways. One method is founded upon the fact that asthma is a nervous manifestation, which grows worse the more the attention is directed to it. If the attention can be diverted, the attack will often pass off. Occurring, as it usually does, at night, the darkness, the surprise, the absence of surrounding activities, increase its effects. If the sufferer be a man, and will get out of bed, put on his gown and slippers, light the gas, take a book or paper, and begin to read, he will, in many cases, soon find his trouble diminishing and finally disappearing. If he be a smoker, his cigar or pipe will help him in this emergency.

A less agreeable method is to take an emetic. Another is to smoke the asthma cigarettes sold in every drug store. Another is to get some steaming hot water in a basin, pour into it a tablespoonful or

more of Hoffman's anodyne, and breathe the ascending vapors. One of the best remedies is a full dose of opium in some form—for an adult, thirty drops of laudanum or a tablespoonful of paregoric. As soon as this takes effect, the spasm of asthma will disappear.

Nervous Attacks, which may take the form of shivering fits, are to be treated by putting the patient to bed, if possible, and giving some hot coffee or tea, or broth, or hot sweetened water, and by applying heat to the body by means of a bath or hot cloths or bottles, with a mild mustard plaster or a turpentine stupe over the pit of the stomach. A teaspoonful of camphor-water, or tincture of valerian, or Hoffman's anodyne, will often prove of great service.

Nightmare—Nocturnal Terrors. In the former there is a terrifying dream; in the latter a terrifying hallucination in the waking state, usually originating in sleep and continuing in the waking state. Thorough arousing and comfort and diversion suffice to allay the disturbance of a nightmare. Nocturnal terrors are harder to manage; but removal to a well lighted room, a drink of cool water, or a dose of aromatic spirits of ammonia, is calculated to relieve them. If either of these conditions occurs often, general treatment is needed, including wholesome

and light diet, with the removal of any cause of the trouble that can be discovered. Often the giving of five or ten grains of bromide of sodium three times in the day for a few days will do a great deal to banish nightmare or nocturnal terrors.

Hiccough.—Hiccough usually stops of itself in a little while ; but its cessation may be aided by swallowing a large well-chewed morsel of bread, or a large draught of water, or by holding the breath as long as possible. In obstinate cases an emetic may be given, as the act of vomiting will rarely fail to cure it.

Cramps in the Legs are best treated by brisk rubbing and kneading of the muscles involved, and wrapping the leg in cloths wrung out of hot water. A dose of laudanum or paregoric may at times be useful.

Toothache, depending upon a cavity in a decayed tooth, is usually very easy to stop. To do this a fine knitting needle or wooden toothpick should have a *very small* bit of clean cotton twisted round its point, and with this the hole in the tooth should be thoroughly cleaned out. Then the point of the needle should be cleaned and another little ball of cotton, like a very small shot, should be dipped in oil of cloves and caught up with the end of the needle. This should then be laid in the hollow tooth

and pushed in, not *too* hard, with the end of the needle. This rarely fails to cure such a toothache. Sometimes filling the cavity with baking soda, after cleaning it thoroughly, will stop the pain.

When toothache is not due to a hollow tooth, a somewhat severe, but usually efficient, plan of treatment is to lay between the gum and the cheek a little wad of cotton, the size of the end of the thumb, soaked in spirits of camphor. This makes a sort of blister, but generally cures the toothache, which is much harder to bear. It can be used only by persons old enough to prefer the pain it causes to that of the toothache. Laudanum or paregoric should be given when other measures fail to control the pain.

Earache should always suggest an examination of the teeth, and if one be found decayed, it may be extracted, or at least cleaned out and packed with cotton and oil of cloves, as described in speaking of toothache. Most earaches depend upon a diseased condition of the throat or back part of the nose, and these should always be investigated in case of earache.

For the pain of earache, a folded cloth, wrung out of hot water, with a teaspoonful of laudanum poured over it, or a hot-water bag, or a big, hot poultice—for which hops is the best material—should be applied to the side of the head and kept as hot as

possible. Hot drinks should be given also, and, if necessary, paregoric or laudanum, to give relief from pain. Pouring into the ear a few drops of sweet oil, quite hot (not hot enough to burn, of course), to which an equal part of laudanum has been added after the oil has been warmed, is a useful measure, in spite of certain disadvantages.

The occurrence of an earache should always lead to consulting a physician; for it is often of importance as a sign of disease which may seriously affect the hearing.

Prickly Heat.—This annoying condition may be met by washing the skin clean, and drying it without rubbing, and dusting on some toilet powder. When the irritation is very great, bathing the seat of irritation with a mixture of one part of vinegar or alcohol to three parts of water may do good; or better still—a lotion of lime-water, with two drops of liquid carbolic acid to each ounce of the lime-water.

Hives. (*Nettle Rash.*)—This eruption usually requires treatment to empty the bowels, and little else. If there is much local irritation, the use of a toilet powder or the lotion recommended for prickly heat will suffice to relieve it.

Mosquito Bites.—When these are unusually trying the best local remedies are pure sweet spirits of nitre, or a mixture of lime-water with two drops of liquid

carbolic acid for each ounce of the former. Another good preparation is made of liquid albolene with ten grains of menthol and two drops of liquid carbolic acid to each ounce. Ammonia water (hartshorn) and spirits of camphor are of use in mild cases. Toilet powders are also helpful at times.

Poisoning by the common Poison Vine (Poison Ivy, see p. 153) causes red blotches, and wheals, and blisters on the skin, with great burning and itching. It is best treated by applying undiluted sweet spirits of nitre, or cloths soaked in a solution of baking soda—a tablespoonful to a pint of hot water, or a salt solution—a teaspoonful to a pint of water. Dusting with magnesia or ordinary toilet powder is also grateful. Lead-water and laudanum (as sold in the drug stores) is often a good application.

Neuralgia of the Face may come on suddenly, when the advice of a physician can not be obtained. In such a case the application of a hot-water bag or a hot cloth, wet or dry, may do much good, or painting the painful part lightly with oil of peppermint, or applying menthol. Cold applications may do good, although warm ones are usually better. The teeth should always be examined, to see if the cause is in them.

Convulsions, from various causes, are to be treated as described on pp. 39-41.

Fever.—It often happens that children unexpectedly develop symptoms of fever when there is no physician at hand. In such cases it is well to know what may be done before medical advice can be obtained. The first thing to do is to get such a child undressed and to bed, and to give it all the cool water it desires to drink. Then a purge should be given, nothing being better than a teaspoonful or two of a mixture of equal parts of castor-oil and spiced syrup of rhubarb, or a tenth of a grain of calomel every half hour until the bowels move freely, or ten doses have been taken. At the same time a teaspoonful of sweet spirits of nitre may be put in a glassful of cool water, and a dessertspoonful or two of this mixture may be given every fifteen minutes or half hour. This acts gently on the skin and kidneys, and often does much good.

A feverish child ought not to be covered up too warm in bed. It will not “take cold” if it is kept moderately cool, and it will be much more comfortable. Nature prompts persons in the heat of fever to get rid of most of their covers; and Nature is a safe guide in the treatment of disease.

For food, a feverish child should be given nothing but milk at first, and *nothing at all* if it does not want to eat. Coolness (not coldness, of course), plenty to drink, nothing to eat, and a good cleaning

out of the bowels are the things most important for cases of simple fever. Many fevers disappear promptly under this treatment, and no case of serious fever is prejudiced by it.

Hernia (Rupture).—A sudden rupture is a rare accident, and should be treated by placing the sufferer on the back with knees raised well up toward the belly and the legs supported by a thick pillow. Then cloths wrung out of cool water should be applied until surgical advice can be had. Laudanum or paregoric, in full doses, should also be given to allay pain and to lessen spasmodic contraction. When a surgeon cannot be had at all, gentle manipulations may be made to get the bowel back where it belongs. Then the middle of a scarf-like bandage of soft folded cloth (or a thick skein of yarn) may be passed round the inner side of the thigh, high up against the crotch, one end being carried up along the groin, round the upper edge of the hip bone and across the small of the back, to meet the other end which is carried round the back of the thigh and up over the front crossing the first part at the point of rupture, and going to the middle of the upper edge of the hip bone of the sound side, then round this to the small of the back, meeting its fellow, and being tied to it in a firm knot. If properly applied this will make an excellent retentive dressing.

If an old hernia becomes what is called “strangulated,” *moderate* efforts to restore it should be made. Moist hot or cool cloths may be applied—whichever seems to do most good—and the steady pressure of a bag partly filled with shot, or a well filled and rather large water-bag may do good. But no *violence* must be used in any case. The patient should be on his back, with legs well raised and supported, and thighs drawn up toward the belly, to relieve tension. Laudanum or paregoric should also be given, as described just above. It should be remembered in both conditions of hernia spoken of above that the passage of wind from the lower bowel is a very good and reassuring sign. The bowels may be emptied by means of an injection (enema) of warm water with a little soap stirred in—but no purgative should be given by the mouth.

Piles (Hemorrhoids).—Unexpected trouble from piles may require surgical treatment; but it may be useful to know that the application of cloths soaked in water as hot as can be borne will often relieve them very much. Beside this, however, applications made after every movement of the bowels, by means of a sponge kept in the bath room for this special use, will usually prevent piles from ever giving much trouble—and this is a case in which prevention is a great deal better than cure. In any case of piles, the bowels

should be kept moving freely—preferably with mild salts, like Rochelle, or citrate of magnesia, or some laxative waters. Pills containing aloes or aloin should not be used, as they may prove very irritating ; nor should large quantities of pepper, mustard or other hot spices be taken with food.

Retention of Urine (sometimes erroneously called *suppression of urine*).—This embarrassing condition may often be relieved by the application of hot, wet cloths to the lower part of the belly. A large quite warm injection, thrown into the lower bowel will often cause the bladder and bowel to be emptied at the same time. In some cases a dose of laudanum or paregoric relieves the anxiety and the spasmodic condition of the bladder so that the urine can be voided comfortably after a little while.

Corns.—One of the first principles in the treatment of what are called “hard” corns is *never* to cut them ! The best and the only proper way to reduce their size is to rub them down smooth with very fine sand paper. This can be done without injury to the normal skin about them. Afterwards they should be covered with a piece of adhesive plaster—the best for the purpose being a thoroughly good court-plaster, or a kid court-plaster, or what is known as ZO plaster. Of course, the skin must be washed perfectly clean before any plaster is put on.

When corns have been inflamed by accident or by unwise treatment, they must be treated, after being well cleansed, with cooling applications and simple ointments, until the local inflammation is subdued. Proper and clean foot coverings must always be worn.

Infant Feeding.—It may happen that an infant, away from medical advice, cannot be fed with mother's milk, and requires an artificial food. In such a case the following simple preparation, thoroughly proved by experience may be used: Cream, three ounces; milk, two ounces; water, ten ounces; table sugar, half an ounce, mixed in a clean bottle, should be put in a vessel of water which is gradually raised to the boiling point and kept boiling for five minutes longer. The bottle should then be removed and cooled, and an ounce of lime water should be added to its contents. This may be kept cool until it is to be given, and then warmed by being set in a vessel of hot water, and then given to the infant from a nursing bottle. Such a preparation may be used for the youngest infant, and up to a year of age.

Water Purification.—If it is desired to purify a suspected water, the simplest method is to boil it for half an hour. Before this is done, a muddy water may be fairly well filtered by means of a large funnel, with the pipe stuffed rather tight with moistened

cotton, bearing in mind that a good filter is always one that acts slowly.* Another method consists in the addition of six grains of alum to each gallon of water, and allowing it to stand for several hours. The alum forms a sort of jelly-like mass in the water, which entangles the solid impurities and carries them to the bottom. After this the upper water may be carefully poured off, or drawn off with a rubber or glass tube bent over so as to form a siphon. Distilling water purifies it very thoroughly; but—like hard boiling—makes the water tasteless, because it deprives it of the air which is found in every palatable water. This may be restored by shaking the water briskly in a large bottle or jar.

* A layer of beach sand, a few inches thick, over the cotton will make the filter act better; and instead of a funnel, a large, clean flower pot may be used, with the hole stuffed with cotton.

Supplies for Emergencies.

The suggestions in the preceding pages have been, as far as practicable, such as could be carried out without having made any special provision for them. Nevertheless, occasionally appliances and remedies have been mentioned which would very much facilitate the treatment if they were accessible.

Emergency Case.

A case suitable for almost any emergency likely to arise in camp, or at the seashore, or in the mountains, might contain the following things:

1. Absorbent cotton.
2. Roll of old muslin or linen and one of soft flannel.
3. Bandages, 2½ inches wide and 6 yards long, rolled up.
4. Rubber adhesive plaster (ZO plaster) on a spool. Kid court plaster.
5. Oiled silk (or paraffine paper).
6. Sharp scissors.
7. Pins (ordinary, and safety pins).

8. Needles, threaded with stout thread.
9. Dressing forceps.
10. Small measuring glass.
11. Cosmoline or vaseline or albolene.
12. Alum—powdered.
13. Ammonia—aromatic spirits of.
14. Calomel tablets.
15. Castor-oil.
16. Cloves—oil of.
17. Epsom salts (sulphate of magnesia).
18. Iron, solution of ter-sulphate.
19. Hartshorn, water of ammonia.
20. Ipecac—syrup of.
21. Laudanum.
22. Lime-water.
23. Mustard, powdered.
24. Nitre, sweet spirits of.
25. Paregoric.
26. Rhubarb—spiced syrup of.
27. Soda—bicarbonate of.
28. Turpentine.
29. Whiskey.
30. Zinc sulphate, in ten-grain powders.

Of liquid medicines, a convenient quantity to have is two fluid-ounces ; except in the case of oil of cloves, of which a fluid-drachm is plenty. Aromatic spirits of ammonia, and hartshorn, and the

spirits of nitre ought always to be kept in bottles having good rubber or glass stoppers.

The bottles of laudanum, paregoric, hartshorn, and oil of cloves (because their contents are dangerous or irritating), should be marked "*Poison!*" and have a tape or small ball and chain attached to their necks, to give warning in the dark; and each bottle should have its proper dose plainly printed or marked on the label.

For the convenience of readers of this book, the author has had made a case containing the remedies and appliances named above (except the old muslin).

This case* (Fig. 41) is made of leather or hard wood polished, and measures $11\frac{1}{4} \times 7\frac{1}{4} \times 4\frac{3}{4}$ inches. It contains 20 two-ounce bottles with glass stoppers, a glass jar for vaseline, and two spaces for surgical appliances. Several of the bottles are left unfilled for other articles which may be desired by the purchaser.

Use of the Emergency Case.

1. **Absorbent cotton** can be obtained at any drug store. It is perfectly clean and soft, and is prepared in such a way that it—instead of resisting moisture, as ordinary cotton does—will absorb fluids with great rapidity. Thus it will take up discharges from

* The Emergency Case, with contents complete may be ordered of the publishers, at a cost of ten dollars.

wounds; and when a cool or hot application is desired, it can be soaked with cool or hot water. Sometimes it is very convenient to put it on dry, and then to squeeze the water upon some part of it from a sponge, when every part will rapidly become saturated.*



FIG. 41.

For padding splints, or making cushions to prevent pressure of any kind, ordinary cotton is better than absorbent cotton.

*In buying absorbent cotton, it should always be tested. If good, a little pinch of it dropped on water will become wet and sink in a second or two. Cotton that floats dry on the surface is not fresh, and is not fit to be sold as absorbent cotton.

2. **Old muslin** or linen can be torn into any shape or size that may be required, and can be used to spread poultices upon. It is also useful to make broad slings of.

3. **Bandages** of the kind described are used to keep applications in place, to secure parts to splints, and to prevent injurious motion.

Roller bandages may be made of the following sizes :

For the finger, $\frac{3}{4}$ inch wide and 1 yard long.

“ arm, $2\frac{1}{2}$ inches wide and 4 to 6 yards long.

“ leg, 3 inches wide and 6 to 8 yards long.

“ chest, 4 to 5 inches wide and 8 to 12 yards long.

“ head, $2\frac{1}{2}$ inches wide and 4 to 6 yards long.

The arm-size bandage is the one of most general usefulness, and the most convenient to have in an emergency case, if only one can be had.

The simplest way to apply a bandage is to make circular turns around any part. When the latter is of even size, this is a very easy matter. Where the part is larger at one end than the other, the ordinary circular turns would not fit smoothly. To accomplish this, the rule is to begin at the small end and make a few turns, round and round, one immediately over the other, and then to begin to move up the limb spirally. So long as a turn can be made to overlap smoothly the one before it about one-third, this spiral

is all that is required. But as soon as it puckers, the bandage is not carried on as before, but is turned down, so that the inner face now looks out, and the bandage, instead of passing up, passes downward so as to make a sort of inverted V—so: Λ . On now carrying the bandage round the part, it will be found that it comes to the front just overlapping the pre-

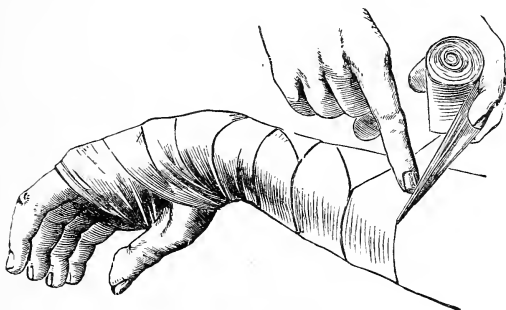


FIG. 42.—Spiral reverse bandage.

ceding turn, and the same process can be repeated until the whole bandage is neatly applied. (See Fig. 42.)

At joints, like the ankle, knee, and elbow, the bandage may make a sort of figure 8, the middle or crossing part being in the bend of the joint, and the two loops, one above and one below it. (See Fig. 43.)

Bandages should never be put on so tight as to cause pain, and should never be drawn tighter above than below ; and the hand or foot should always be snugly covered in any bandage going to the arm or the leg.

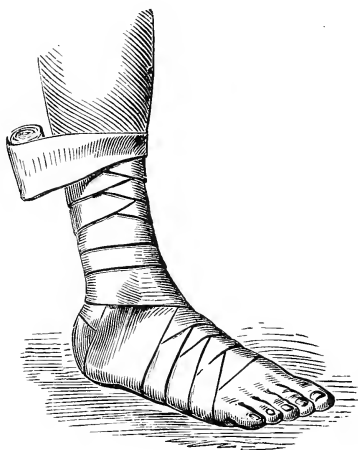


FIG. 43.—Figure 8 of ankle.

Bandages may be fastened with pins, with strips of adhesive plaster, by stitching, or by splitting the end, crossing the two strips, carrying one tail on as before, turning the other back to meet it, and then tying the two together.

When a narrow bandage is called for—as for a finger—a broader one may be torn down the middle; or, if rolled up, it can be laid on a firm surface and the whole roller cut to the desired width with a razor or a sharp knife.

4. **Rubber adhesive plaster**—of which the best is that called ZO plaster—is better than any other kind, because it can be applied without heat or moisture. It sticks of itself. When it is to be applied to a hairy part, the hair should first be shaved off, if possible. When the plaster comes to be removed, it may be soaked off with benzine, or gasoline, or naphtha—*never near fire*—or even turpentine, to the great advantage and comfort of the patient. Any rubber plaster, if kept on long, may set up an eruption on the skin. This must be borne in mind, especially in summer and in the case of women and children.

In changing adhesive-plaster dressings, only as much need be removed as is necessary or as cleanliness demands. The rest may be left on, and the new dressing applied up to or over it. In the end all can be removed together.

Rubber plaster is sold in strips on spools. These strips can easily be cut smaller; while additional strips may be applied side by side if a greater width is wanted.

5. **Oiled silk** or paraffine paper is used to retain heat and moisture after poultices or other warm wet dressings are applied.

6, 7, 8. **As to the use of scissors, pins, and needles**, it may be stated that the points of pins should never be left sticking out; and care should be used to avoid sticking either pins or needles through a patient's skin.

9. **Dressing forceps**, having a joint like that of scissors, take the place of fingers in handling dressings

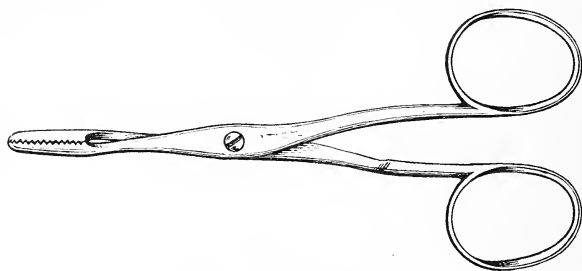


FIG. 44.—Dressing Forceps.

and small parts and removing splinters or other foreign bodies. They should be sterilized after each use by washing and rubbing, and then holding them for about a second in the flame of an alcohol lamp, or a match.

10. **The measuring glass** is much more accurate than a spoon, and should be used, if possible, in preference to the latter.

11. **Cosmoline**, and **vaseline**, and **albolene** are

excellent as applications to a variety of wounds or injuries. As they never become rancid, they are preferable to cold cream for an emergency case.

12. **Alum** (in powder) added to water is useful for checking bleeding; and a dose of half a teaspoonful is sometimes useful as an emetic for children in croup or whooping-cough.

13. **Aromatic spirits of ammonia** is a stimulant often recommended in the preceding pages. It is also useful in acid dyspepsia, nervous or sick headache, and simple nervousness. The dose is, for an adult, a teaspoonful, in about a wineglassful of water; for a child, ten drops to half a teaspoonful, in a tablespoonful or more of water. This may be given every fifteen minutes until four or five doses have been taken.

14. **Calomel** is admirable as a dusting powder for chafing or irritation of the skin, and given internally ($\frac{1}{10}$ grain every half hour for ten doses, or until the bowels act freely) is one of the best means of clearing out and putting in good shape the bowels.

15. **Castor-oil** is an excellent external application wherever an oily preparation is needed. Besides this, it is unquestionably one of the very best remedies for an incipient cold, and generally useful as a purge. It may be made less unpleasant, and in some respects improved in action, by the addition to it of

an equal part of glycerine or spiced syrup of rhubarb. Such a mixture may be given without much trouble to almost any child, especially if it is warmed until it runs thin, and given from a cup or spoon that has been heated, or if it is well shaken up with milk.*

16. **Oil of Cloves** is used chiefly to cure toothache; but a few drops added to a teaspoonful of olive oil and rubbed into the skin will often relieve the pain of neuralgia in various parts of the body. It is also useful in indigestion, in doses of three drops for an adult and one drop for a child. This may be given rubbed up with a little sugar, or in a teaspoonful of sweet oil, or spiced syrup of rhubarb.

17. **Epsom Salts** (sulphate of magnesia) is an admirable and well proved cathartic. The dose for an adult is a tablespoonful, dissolved in about a tumblerful of water. A teaspoonful every hour will often produce a mild but free action of the bowels after eight or ten doses have been taken. It is also the best antidote for carbolic acid or sugar of lead poisoning.

* The best way to give castor-oil to adults is to warm a cup and squeeze half a lemon into it; then to pour on this a tablespoonful of castor-oil warmed till it is thin; then on this to squeeze the other half of the lemon. The patient may now put the lemon to his mouth and press a little juice out of it, biting the skin, to get a little oil of lemon out of it, and then swallow the dose. The most delicate women may take oil in this way without finding it disagreeable.

18. **Iron Sulphate** (tersulphate of iron) is used in preparing the best antidote to arsenic, as described on page 133. It is also an astringent and may be used, on cotton or muslin or gauze, to control bleeding.

19. **Hartshorn** (water of ammonia) is a stimulant to the heart and to the nervous system, and an antidote to acid poisons—except carbolic acid and arsenous acid. As a stimulant, a half teaspoonful should be put in a tumblerful of water, a tablespoonful of the mixture being given every few minutes. When used by inhalation, a bottle of hartshorn should never be brought near to a patient's face. The stopper may be wetted and held near the nose, or a few drops may be put on a handkerchief or the hand and used in the same way. It is sometimes very comforting to put a few drops on a handkerchief and fan over this toward a person who is very weak.

20. **Ipecac.**—The syrup of ipecac is a fairly good emetic, if used freely. An adult should be given a good tablespoonful, and an infant as near a teaspoonful as possible. It will do no harm; and when an emetic is called for, it is no time to run any risk that the dose given may not be large enough. It is often usefully employed in cases of poisoning, convulsions, croup, whooping-cough or asthma.

21. **Laudanum** (tincture of opium) is one of

the most useful drugs in the world, and only in foolish hands a dangerous one. There need be, however, no fear of poisoning with any preparation of opium if ordinary doses are given, and if these doses are not given closer together than half an hour, and if they are *stopped* as soon as pain is decidedly lessened or drowsiness comes on. To relieve pain the dose is thirty drops for an adult, and for a child half as many drops as its years number. It should always be remembered that in a bottle often opened laudanum becomes stronger because of the evaporation of the alcohol.

One sign of the effect of opium on the system is a contraction of the pupil of the eye, which does not expand in the dark—the test being made by first closing or shading both eyes, and then suddenly exposing them, to see if the pupil has enlarged when protected. In persistent contraction of the pupil the use of opium should be stopped.

To check diarrhœa, a drop of laudanum given every hour will sometimes prove successful very soon.

For cuts and bruises a good application is a cloth, soaked in laudanum, and occasionally wetted with it, without removal. It quiets pain and promotes healing. A similar application is often very soothing in faceache, toothache, and earache, as well as in the pains of rheumatism and neuralgia.

22. **Lime-water** may be prepared by putting a piece of lime as large as a small apple in a quart or two of water and allowing the mixture to stand for a few hours. The clear water may be poured off and bottled for use. In an emergency a piece of lime as large as a walnut may be put in a half-pint bottle of water, the whole being well shaken for a minute or two. The water may be strained through a cloth or allowed to clear by settling, according to the degree of haste required.

Lime-water is used to settle sick stomachs, as an antidote to acid poisons, and in combination with sweet oil as an application to burned surfaces.

23. **Mustard.**—Ground mustard is useful in plasters and poultices. In plasters, it should be made weaker by the addition of flour—an equal part or more of the latter, as the plaster is to be stronger or weaker. In adding mustard to poultices, it should be first well mixed with water or white of egg, and then stirred into the poultice mass.

A mustard plaster often acts quickly, and its effect should be carefully watched, and the plaster should be removed in a few minutes or as soon as the skin is well reddened. Where it is desired to leave a mustard plaster on for more than a few minutes, it should be made of one part mustard to four or more of flour. Blisters from mustard plasters are excessively

painful and hard to heal. Further, when mustard plasters are applied to persons who are more or less unconscious, or paralyzed, or of dull intellect, or very young, they must not be left on until the patient shows uneasiness. In such cases the attendant must look at the skin soon and often, to prevent occurrence of blistering.*

24. **Nitre** (sweet spirits of nitre) is a most useful domestic remedy. A teaspoonful may be added to a tumblerful of water, a tablespoonful of the mixture to be given to an adult, or a dessertspoonful to a child of any age, every half hour, in any feverish condition. This promotes healthy activity of the skin and kidneys, and will often loosen a "tight" cough.

25. **Paregoric** is an opium preparation which contains, besides opium and other things, some camphor. It is the best preparation for children, because the dose is easier to measure than that of laudanum. An infant a few hours old will stand three drops, and one of a few days, five. In a month, ten drops are not too many; and twenty may be given any time after six months. At six

* Red Pepper may sometimes be used instead of mustard; though it is more energetic in its action. When moistened and applied to the skin, red pepper first causes a feeling of warmth, and later of intense, fiery burning. If left on long enough it will cause a blister. Red pepper diluted with flour may be applied in cases of colic or cholera morbus, where it quiets pain by its counter-irritant effect, and stimulates the nervous and circulatory systems.

years a teaspoonful may be given for pain; and an adult may take a tablespoonful. It may be used internally in all the cases for which laudanum has been recommended.

26. **Rhubarb.**—The spiced syrup of rhubarb is an excellent mild laxative for the bowels. A teaspoonful is the dose for an infant or small child. It is useful at the beginning of a diarrhœa in children, as it empties the bowels of what irritates them, and also has a soothing and healing influence. The use in combination with castor-oil has been described above.

27. **Soda.**—Bicarbonate of soda (baking soda) is useful as an application to burns, as an antidote to acid poisons, and for heartburn. For the latter the dose is a saltspoonful dissolved in a tablespoonful of water.

28. **Turpentine.**—Spirits, or oil, of turpentine may be used wherever mustard has been recommended as an external application. For this purpose a soft flannel or muslin cloth may be dipped in turpentine, wrung out nearly dry, laid on the surface, and covered with oiled silk or a few thicknesses of dry cloth, to prevent evaporation.

A milder form of application is what is called a “turpentine stupe.” This is prepared by sprinkling a tablespoonful of turpentine over a flannel cloth (folded to several thicknesses) that has been wrung

out of hot water. It is in some respects better to stir the turpentine into a pint of hot water, and then to saturate the cloth with the mixture.

Turpentine is also an antidote to phosphorus poisoning.

29. **Whiskey** for medicinal use should be of the very best quality. It should always be used in small doses—a teaspoonful for an adult—in hot water, frequently repeated. Children rarely need it; but in collapse a dose of fifteen drops, with water, is not too much for a child.

How to Make Poultices.

Poultices.—The commonest materials for poultices are hops, bread, flaxseed, and corn meal. A hop poultice is made by pouring hot water upon hops until they are well moistened. A bread poultice is made by soaking the inside of bread in hot water or milk, and mashing it quite soft and even. With flaxseed or corn meal the way is to have a vessel containing hot water and to pour into it flaxseed meal or corn meal, constantly stirring, until the mixture is as thick as porridge, almost (but not quite) soft enough to run. Poultices should be spread about half an inch thick. To spread a poultice, a piece of fine old muslin (or a piece of open-meshed stuff, such as ordinary cheesecloth), twice as

long as the poultice is to be, is laid on a flat surface, and the middle of it is spread smooth with the poultice material. The two ends are then brought over, so as to overlap, and pressed down on top of the poultice material; or another piece of muslin or a piece of tarlatan may be used for this purpose, so that the poultice material shall not come into immediate contact with the skin; then, when it is removed, it will come off easily and not leave any behind to stick to the skin.

A poultice must be put on quite hot. To insure this, it may be spread upon a hot plate. A simpler plan, however, is to take the finished poultice up by its edges and lay it for a moment or two on something hot, or to dip it into a vessel containing boiling water. Care must be taken not to put on a poultice so hot as to burn.

To keep a poultice warm when applied, it should be covered with oiled silk or paraffine paper and a folded towel.

A Spice Plaster is made by mixing a teaspoonful of each of as many spices—pepper, mustard, ginger, cinnamon, nutmeg, etc.—as can be found in the house, and moistening them gradually with *hot* water, with constant stirring, until the mass is soft and pasty, and then spreading this upon linen and applying the paste directly to the skin. It may remain in place for an almost indefinite time.

Disinfectants.

Disinfectants are applied to persons, apparel, furnishings, apartments, and discharges. For persons a good hot bath, with soap, including shampooing of the hair and beard, is the most convenient mode of disinfection. Apparel and room furnishings may be boiled or baked, and exposed to direct sunlight for several hours. Apartments and furniture should be disinfected by opening all trunks, chests, bureaus, and closets, and closing all doors and windows tight, and generating formaldehyde gas in the room, by means of an apparatus sold for the purpose. This is the best mode now known to science. The next best method is the burning of sulphur, placed upon a metal plate (like a stove-lid) set on a brick standing in a tub containing water to a depth of about six inches. The amount of sulphur should be about four pounds for every thousand cubic feet, as determined by multiplying the length of the room by its breadth and its height; and the room in which it is burned should be kept closed—including cracks and

keyholes—for twenty-four hours. After this it should be thoroughly aired. Sulphur disinfection is not nearly as reliable as formaldehyde disinfection, and is more likely to affect the color and injure the structure of hangings and carpets.

Discharges may be disinfected with a solution of chloride of lime in water—six or eight ounces of the former to a gallon of the latter. Milk of lime is also useful. This is made by thoroughly slaking lime with about a third of its volume of water, and adding three times as much water as the volume of the resulting creamy fluid. The lime preparations are deodorants as well as disinfectants.

Signs of Death.

In the absence of a physician it sometimes becomes important that others shall be able to determine whether or not death has taken place. The occurrence of death can be recognized by the following signs: The breathing and pulse cease, the surface becomes pale, the muscles relax, the lower jaw falls a little, the "sight" of the eye becomes dull and glazed, the upper lid falls so as to partly cover the eyeball, then the whole body gradually cools to the temperature of the surrounding air, and becomes rigid, while, later, decomposition sets in, and usually shows itself first by a greenish discoloration of the surface of the abdomen.

But it does not require the detection of all these signs to determine that death has taken place. The cessation of breathing and of the heart-beat is a safe basis for an opinion. It requires some care, however, to decide that there is no breathing or circulation. To test the former, a cold piece of polished steel—like a razor blade or table knife—can be held

under the nose and before the mouth. If no moisture condenses upon it, it is safe to say there is no breathing. Or, a glass of water may be placed on the chest and watched to see if there is any motion in the water. To test the cessation of the heart-beat, it is not enough to feel for the pulse at the wrist. The largest blood-vessel in the body (see frontispiece) runs directly down from the heart, along the left side of the spinal column, and its strong beating can be plainly felt in most people by pressing the finger tips firmly down toward the backbone, at the point below the breast-bone called the "pit of the stomach." In this place the slightest pulsation of the heart can be felt if the walls of the abdomen are slack enough to permit the finger to get near the backbone; and here examination should be made before deciding that the heart has ceased to beat. Another test is listening over the region of the heart, in front of the left side of the chest. An acute ear can always detect the movement of the heart by sounds made by its valves, which, when perfect, sound like the syllables "ub—dup," "ub—dup," and so on. If a string is tied tight round a finger, and there is no reddening or swelling below it, it is a sign that the circulation has ceased there. If on careful listening the heart-sounds can not be heard, and the cold metal, or glass of water fails to show

any evidence of breathing, the individual may certainly be said to be dead.

When, in addition to these signs, paleness, muscular relaxation, a glazing eye, increasing coldness, and then rigidity come on, it hardly requires the onset of decomposition—the infallible sign—to prove that death has occurred.

The electrical battery may be used in doubtful cases. Electricity distinguishes with absolute certainty between life and death. Within two or three hours after the stopping of the heart the whole of the muscles of the body will have completely lost their electric excitability—when stimulated by electricity, they no longer contract. If, therefore, there is no contraction when a strong current of electricity is applied to the muscles of the face, limbs, or trunk, death has occurred. No faint, no trance, no stupor, however deep, can prevent the manifestation of electrical muscular contractility.

The modern method of preparing bodies for burial by “embalming” is a sure preventive of burial alive; because, if the subject were not dead when the process of embalming was begun, he would be killed by it.

But ordinarily it is very easy to decide between death and life; and the fear of being buried alive, which torments many people, is without good founda-

tion. The stories upon which it rests are such as an excited imagination might easily invent, and natural fear propagate, but they do not bear critical investigation. In certain European cities, for many years, the bodies of hundreds of thousands of those supposed to be dead have been placed in rooms where ingenious appliances and careful watching have been used to detect the slightest evidence of life, and in *not a single case* has a mistake been found to have been made.

A review in the *British Medical Journal*, January 9, 1897, ridicules the danger of burial alive by saying that the book reviewed, and written to prove the danger, cites in 400 pages only one case reported in England, and that occurred over a century and a half ago.

The author has for years investigated cases in which it has been reported in the newspapers that persons had been buried alive; and in every case in which he could get information from a trustworthy source the story has been found to be absolutely false.



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